

# COLLINGWOOD HARBOUR

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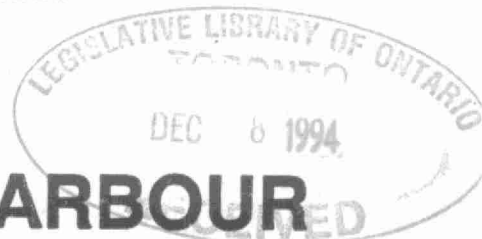
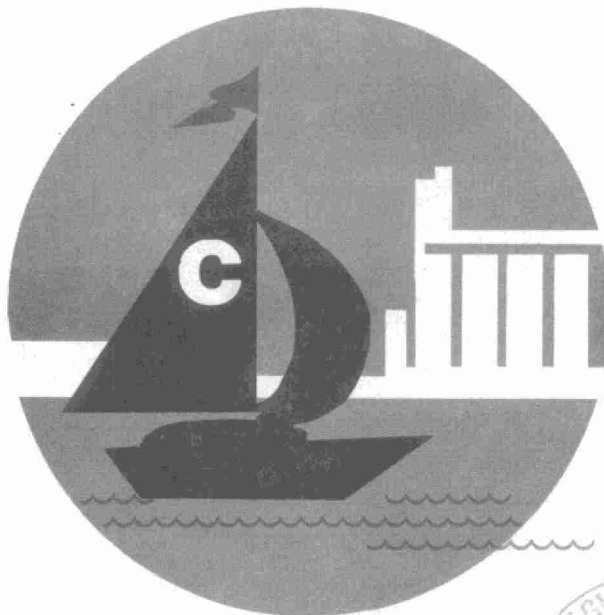
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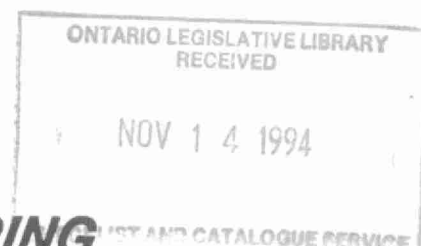
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## REMEDIAL ACTION PLAN



## COLLINGWOOD HARBOUR REMEDIAL ACTION PLAN STAGE 2 REPORT



***A STRATEGY FOR RESTORING  
THE COLLINGWOOD HARBOUR ECOSYSTEM  
AND DELISTING COLLINGWOOD HARBOUR  
AS AN AREA OF CONCERN***

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# **COLLINGWOOD HARBOUR REMEDIAL ACTION PLAN STAGE 2 REPORT**

***A STRATEGY FOR RESTORING  
THE COLLINGWOOD HARBOUR ECOSYSTEM  
AND DELISTING COLLINGWOOD HARBOUR  
AS AN AREA OF CONCERN***

**PREPARED BY THE COLLINGWOOD HARBOUR RAP TEAM  
IN CONSULTATION WITH THE PUBLIC ADVISORY COMMITTEE**

**AUGUST 1992**

## PREFACE

Under the Great Lakes Water Quality Agreement (Amended 1987) and the Canada-Ontario Agreement Respecting Great Lakes Water Quality, the Governments of Canada and Ontario are developing Remedial Action Plans to restore impaired uses of the aquatic ecosystem in seventeen of the forty-three Areas of Concern on the Great Lakes. Collingwood Harbour is one of these Areas of Concern.

Since designation of Collingwood Harbour as an Area of Concern in 1977, the Collingwood Harbour Remedial Action Plan (RAP) has been working towards ways of addressing and correcting the harbour's environmental problems. The fundamental goal of the Collingwood Harbour RAP continues to be the improvement and protection of the quality of Collingwood Harbour's waters. The RAP takes an ecosystem approach to restoring the Collingwood Harbour environment by considering all activities within the watershed that have contributed to the health of all organisms that are supported by the harbour.

The RAP process has provided opportunities for the community to get involved and to act on their commitment to resolve the harbour's environmental problems. The RAP Team and the Public Advisory Committee (PAC) need public input to achieve consensus on actions that will improve and protect the harbour environment. The RAP Team, in consultation with the PAC, has incorporated comments received from the public through newsletters and open houses when preparing this report for submission to the federal and provincial governments and other implementors.

*Release of this Stage 2 report is intended to provide information of the preferred remedial options which are being recommended as a strategy to restore beneficial uses to Collingwood Harbour and delisting the harbour as an Area of Concern. The report in its current form represents the conclusions of the RAP Team and the PAC and has not been officially adopted by the federal or provincial governments. All implementors will provide responses to the recommendations contained herein.*

Everyone is encouraged to participate in the RAP process. For more information on the Collingwood Harbour RAP, contact one of the offices below.

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## ACKNOWLEDGEMENTS

The Collingwood Harbour Remedial Action Plan Stage 2 Document was prepared by the Collingwood Harbour RAP Team and the Public Advisory Committee. The RAP Team thanks the COA RAP Steering Committee for their recommendations on improving the Stage 2 Document.

As RAP Coordinator, I gratefully acknowledge the invaluable technical assistance of the RAP Team members:

Michael D'Andrea, P. Eng. (Great Lakes Section, MOE)  
A. Smith (Ontario Ministry of Natural Resources)  
L. Reynolds (Environmental Protection, Environment Canada) and  
W. Lammers (Central Region, MOE)

and the extensive input, review and constructive comments provided by members of the Public Advisory Committee (PAC). The integral role of PAC in providing the guidance needed to complete the development of the Plan must be recognized, along with the extraordinary leadership of the PAC chairperson, Ed Houghton. The cooperative spirit that is the foundation of the Collingwood Harbour RAP has enabled us to focus our energies on forging a comprehensive and timely plan.

I cannot overstate my profound gratitude to the Town of Collingwood for their support during RAP development. In particular, the phosphorus control strategies which form the cornerstone of the plan could not have been formulated without the inexhaustible efforts of Environmental Engineer Don Green, Town Engineer Ken Astill, and Collingwood Sewage Treatment Plant Operator Herb Hockley. The endorsement provided through three changes of Town Council, is evidence of the dedication to environmental improvement pervasive in Collingwood. I thank the Collingwood Public Utilities Commission in providing detailed information on water conservation initiatives, central to the restoration of water quality for Collingwood Harbour.

Many of the remedial actions contained in the plan are now under way. This serves as a testimony to the commitment of PAC members to restore the Harbour environment. The majority of the nontechnical options are currently being implemented as a results of months and years of volunteer efforts generously advanced by PAC. I look forward to many new and rewarding opportunities and milestones as government agencies and the community of Collingwood work together to delist Collingwood Harbour as an Area of Concern.

Dr. Gail Krantzberg  
Coordinator, Collingwood Harbour RAP  
Water Resources Branch, MOE

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THE ONLY SOLID PIECE OF SCIENTIFIC  
TRUTH  
ABOUT WHICH I FEEL TOTALLY  
CONFIDENT  
IS THAT WE ARE PROFOUNDLY IGNORANT  
ABOUT NATURE

LEWIS THOMAS, 1974

As the old man walked the beach at dawn, he noticed a young man ahead of him picking up starfish and flinging them into the sea. Catching up with the youth, he asked him why he was doing this. The answer was that the stranded starfish would die if left in the morning sun. The old man countered, "But the beach goes on for miles and there are millions of starfish, how can our effort make any difference?"

The young man looked at the starfish in his hand and threw it safely into the waves. "It makes a difference to this one," he said.

Author unknown.



**REACHING THE GOAL:  
A DELISTING STRATEGY FOR  
COLLINGWOOD HARBOUR**

**EXECUTIVE SUMMARY**

In 1977, Ontario identified Collingwood Harbour as one of 17 Great Lakes Areas of Concern (AOC) as part of a binational agreement to restore and protect the Great Lakes. Nuisance algal growth plagued the harbour waters up until the mid 1980s as a result of excessive phosphorus inputs to the harbour. The federal and provincial governments assembled a Remedial Action Plan (RAP) Team, with a goal which is vital to the future of Collingwood: to improve the harbour's water quality and restore or maintain the beneficial uses that the harbour supports.

In fulfilling this mandate, the RAP has followed what is known as an "ecosystem approach." In short, that philosophy means that whatever remedial actions are taken, they must be consistent with a respect for the entire Collingwood Harbour ecosystem, the animals, plants and people that interact with one another within a shared environment. As a result, wildlife habitat, sources of contaminants beyond the harbour, and land uses that effect water quality, also fall within the RAP's purview.

Public consultation and involvement is central to the RAP. In addition to its consultative role in establishing goals and beneficial uses for Collingwood Harbour, the Public Advisory Committee (PAC) has been evaluating and selecting remedial actions to achieve those goals and uses. PAC has also helped in raising public awareness of RAP activities through newsletters, fact sheets, presentations to and publications for clubs and schools, the development of ENVIROPARK, organization of teaching packages for elementary, secondary and college level student, and articles in the local media. In future, the PAC will assist in generating support for the implementation of remedial actions and will provide a means of reporting to the community on the effectiveness of remedial measures once they are in place.

On the basis of use goals approved by the PAC and the large data base on environmental conditions and sources of potential problems, options for remedial action in Collingwood Harbour were generated (Krantzberg et al. 1989, COA/RAP 1991). The scope, objectives, advantages, disadvantages and estimated costs and benefits of each remedial option were presented in a discussion paper "Making Choices" for agency and public consideration. After a lengthy process of consultation and review with the PAC, the RAP Team has reached a consensus on the preferred remedial measures for Collingwood Harbour.

A critical component of the strategy is to reduce the amount of phosphorus entering the harbour. This will prevent excessive growth of aquatic plants which can rob the water of oxygen as they decay, thereby making the harbour inhospitable to other species. A maximum phosphorus load has been assigned to the Collingwood sewage treatment plant, which contributes over 90% of the phosphorus (P) load to the harbour. Technical solutions focus on optimizing phosphorus removal at the Collingwood STP and extending the STP outfall from its current location of several meters off shore to 500 meters into the harbour to permit more complete mixing. A P loading target of 2760 kg/year from the STP has driven the development of many of the recommendations contained in the Stage 2 document.

A strong emphasis has been placed on educating the community on the environmental significance of water conservation and the use of environmentally helpful products. From school children to industrial water users, the RAP and PAC are developing or have programs in place to encourage renewed respect for water as a precious resource. The need to continue Collingwood's already well established water conservation program cannot be overstated.

To provide safe haven for all members of the harbour ecosystem, efforts are in place to protect the existing Collingwood Wetland Complex, and to rehabilitate fish and wildlife habitat in conjunction with future development at the waterfront. As development proposals involving the harbour shoreline come forward, the RAP and PAC have recommended that due consideration be given to the creation of refuge for a wide variety of aquatic life. This will be approached by incorporating the RAP principles into the Official Plan for the Town of Collingwood. Rehabilitation of Black Ash Creek to provide erosion control and create fish habitat is also underway and will contribute to the enhancement of fish and wildlife populations in Collingwood Harbour.

The philosophy of zero discharge of persistent toxic substances has been adopted by the RAP, for the protection of all members of the ecosystem. Currently, persistent toxic substances are not detected in the harbour, and the RAP and PAC want to ensure these conditions are preserved. Harbour sediment no longer contains elevated concentrations of metals and trace organic compounds are below detection. Extensive field and laboratory bioassessment spanning from 1989 through to 1991 revealed that sediment in the harbour does not have toxic properties.

As a result of the community's dedication to the RAP, water quality has improved dramatically over the last 5 years due to noteworthy improvements in the STP operation, and process changes at local industries. Nutrient loadings to and concentrations in the harbour in 1989, 1990 and 1991 were substantially lower than in previous years, and mean phosphorus concentrations in the harbour waters from April to September in 1990

and 1991 met the provincial objective and RAP delisting guideline of 20 ug/l for the prevention of nuisance algal growth. Further monitoring programs will be designed to continue to track nutrient dynamics and ensure that the restoration of water quality is maintained.

Contaminants in sediment marginally exceed the provincial open water disposal guidelines at a single station in 1991. Numerous biological studies have demonstrated that there is no toxicity associated with the sediment. A technical report on freshwater mussel biomonitoring released February 1992 found tissue concentrations of metals and trace organic contaminants comparable to controls. Benthic enumeration for comparison with the RAP delisting guidelines was completed April 1992 and revealed the presence of mesotrophic indicator species.

With a single exception of yellow perch greater than 14 inches (35 cm), there are no fish consumption advisories. The restriction on perch generated in 1984 was based on elevated mercury concentrations and was demonstrated to not be due to local sources in the harbour. Yellow perch measuring 35 cm were caught by local residents in the spring of 1990 and mercury concentration was  $0.39 \text{ ug.g}^{-1}$ . The consumption advisory is based on tissue concentrations greater than  $0.50 \text{ ug.g}^{-1}$ . Concentrations of PCBs in young-of-the-year spottail shiners were below the RAP delisting guideline and IJC objective of  $0.1 \text{ ug.g}^{-1}$  for the protection of aquatic life and PAHs in shiners were comparable to other locations in the Great Lakes.

Sources of phosphorus to the harbour include the sewage treatment plant (STP), watershed runoff and precipitation. The most significant single source of P is the STP. Bacteria enters the harbour with watershed runoff and STP effluent. In 1990 over 70% of the bacteria and over 90% of the P entering the harbour originated with the STP. Bacteria in harbour waters met the provincial objectives for and RAP delisting guideline for body contact recreation from April to October, 1990 and 1991. Metals in sediment are from historic harbour uses. In 1991, PCBs in sediment were below detection.

The results of the water quality and hydrological surveys were modelled to facilitate the development and evaluation of remedial options, and a report was released November 1991.

The preferred Remedial options include optimizing phosphorus removal at the STP, coordinated by a STP task force with representation from the municipality, MOE and the Environment Canada. Water conservation, modification of the current STP outfall, and incorporation of new proven technologies for effluent polishing are recommended options. Included in the RAP strategy is the protection and rehabilitation of fish and wildlife habitat, currently being implemented in Black Ash Creek and through a Purple Loosestrife Control Program.

## **REMEDIAL ACTIONS TO DATE:**

Construction has begun on an environmental adventure playground called the RAP ENVIROPARK, designed to teach children about sources of pollution to the Harbour as they play. This represents implementation of a preferred remedial option.

In March 1991 a poster sized tapestry map indicating sources of pollution to the harbour was provided as a teaching aid to all classrooms in the Collingwood area, and is available in the library, chamber of commerce, tourist office, and town hall. In April 1992, an advanced information package "Explorations: A Discovery Manual" was distributed to area secondary schools and clubs. These activities represent implementation of public awareness options. Public awareness programs have also been implemented for mariners and anglers.

In addition to the implementation of the public awareness program, remedial measures at the STP brought effluent quality within the provincial objectives by 1986. In 1990 and 1991, the mean phosphorus concentration in STP effluent was approximately 0.5 mg.l<sup>-1</sup>. Ongoing efforts to improve STP operational efficiency include the completion of a computerized plant process audit, with the recommendations for optimization of the STP receiving a high priority for implementation in Collingwood, MOE and Environment Canada. Bacterial contamination of the harbour waters is not observed.

Closure of the Collingwood Shipyards in 1986 brought a halt to contamination from the shipbuilding industry. Dredging of the harbour in 1986 removed sediment with metals and PCBs marginally above the provincial guideline for open water disposal of dredged sediment. No toxicity is associated with sediment, and in 1991, PCB concentrations were below detection, demonstrating natural recovery.

The Black Ash Creek Rehabilitation Project began in December 1991 and will proceed for approximately 18 months. The intent is to control erosion and siltation, improve water quality, and rehabilitate fish and wildlife habitat.

The challenge is to unite the community in a long term plan that will enable the Harbour to support a diversity of uses while maintaining a diversity of life. The goal is to ensure that individual actions are compatible with the goal of restoring and maintaining the harbour ecosystem. With greater awareness of the importance of water conservation, the informed selection of consumer products, and other activities the community can assist in sustaining and enhancing the harbour's aquatic environment. With the continued assistance of the Federal and Provincial governments, the Municipality and the community as a whole, Collingwood Harbour is well on the road to full recovery.

This report details the RAP process in Collingwood, the historic and current environmental conditions, proposed delisting criteria for Collingwood Harbour, and the remedial actions

being recommended in order to achieve those targets. The preferred option numbers refer to the original numerical scheme presented in "Making Choices", a discussion paper on remedial options for Collingwood Harbour.

What follows is a summary of the recommended remedial actions, the rationale for the endorsement, and public discussion and comments regarding the selection and implementation of the preferred options.

The matrix below illustrates the preferred remedial actions being recommended for implementation. These are the remedial measures necessary for restoration of the Collingwood Harbour ecosystem. Additional remedial actions are also being recommended for inclusion in the overall Remedial Action Plan and are located on page 14 of the executive summary. These activities are viewed as extremely important in enlisting public involvement in restoring the harbour ecosystem, although not necessarily vital for achieving the proposed delisting targets.



**A DELISTING STRATEGY FOR COLLINGWOOD HARBOUR**  
**PREFERRED OPTIONS FOR THE RESTORATION OF BENEFICIAL USES**

| LJC BENEFICIAL USE TO BE RESTORED/<br>PAC GOAL  | REMEDIAL ACTION  | NOTE | BENEFITS   | PROB-<br>ABLE<br>EFFECT<br>//LEAST<br>////MOST | OBSTACLES   | PARTNERS IN<br>IMPLEMENT-<br>ATION  | ESTIMATED<br>COST  |
|---|--|------|--|--|---|---|--|
| RESTRICTIONS ON<br>DREDGING<br>ACTIVITIES/<br>INDUSTRIAL PORT   | OPTION 14:<br>CONFINED<br>STORAGE OF<br>SEDIMENT                             | 1    | •REMOVES CONTAMINATED<br>SEDIMENT<br>•DEEPENS NAVIGATIONAL<br>CHANNEL<br>•FILLS CONFINED DISPOSAL<br>FACILITY  | ////   | •SHORT TERM DISRUPTION<br>OF BENTHOS  | TRANSPORT CANADA<br>WITH: ENVIRONMENT<br>CANADA, MOE,<br>COLLINGWOOD<br>TERMINALS (7), CSL,<br>TOWN (7) | \$400,000  |
| EUTROPHICATION<br>OR UNDESIRABLE<br>ALGAE<br>AND<br>DEGRADATION OF<br>AESTHETICS/<br><br>NO ADVERSE<br>CHANGE ON<br>NOTTAWASAGA<br>BAY<br><br>PASSIVE<br>RECREATION<br><br>MEETS<br>PROVINCIAL<br>BACTERIOLOGICAL<br>GUIDELINES | OPTION 5:<br>COMPUTERIZE<br>OPERATIONS AT<br>THE EXISTING<br>STP             | 2    | •REDUCES P IN EFFLUENT<br>CONSISTENTLY TO 0.3 mg/l<br>•REDUCE PLANT UPSETS<br>•ASSISTS IN MEETING MOE<br>GUIDELINES<br>•REDUCES ENERGY<br>CONSUMPTION  | ///  | •MAY NOT BE SUFFICIENT<br>FOR RESTORATION OF<br>WATER QUALITY ALONE   | TOWN, MOE,<br>Wastewater Technology<br>Centre   | \$440,000 - \$1.1<br>Million   |
|   | OPTION 7:<br>EXTEND THE<br>OUTFALL INTO<br>THE HARBOUR<br>WITH A<br>DIFFUSER | 3    | •IMPROVED ASSIMILATION<br>BRINGS HARBOUR WATERS TO<br>MOE GUIDELINES OR BETTER<br>•CONFORMS BETTER TO<br>MOE'S REQUIREMENTS FOR<br>STP DIFFUSER DESIGN | ////   | •PUBLIC OBJECTION TO<br>"DILUTION" AS A SOLUTION  | TOWN, MOE   | \$2.1 Million  |
|   | OPTION 27:<br>WATER<br>CONSERVATION  | 4    | •ALLOWS FOR GROWTH OF<br>TOWN<br>•CAN REDUCE TOTAL P<br>LOADING TO HARBOUR<br>•REDUCES COST OF WATER<br>TREATMENT                                      | //   | •COMMUNITY<br>COOPERATION REQUIRED<br>•MAY ENCOUNTER<br>RESISTANCE TO SEWER-<br>USE SURCHARGE   | ENTIRE COMMUNITY<br>OF COLLINGWOOD  | DEPENDS ON<br>INITIATIVE<br>SOME COST<br>SAVINGS TO<br>TOWN  |
|   | OPTION 6:<br>(REVISED)<br>INCORPORATE<br>NEW<br>TECHNOLOGY<br>INTO THE STP   | 5    | •INCREASED EFFICIENCY OF<br>STP OPERATION REDUCES P<br>LOAD TO HARBOUR   | ///  | •CONTINGENT UPON<br>DEVELOPMENT OF NEW<br>TECHNOLOGY<br>•EXISTING INNOVATIVE<br>APPROACHES MAY NOT BE<br>EFFECTIVE IN NORTH-<br>TEMPERATE CLIMATE | TOWN, MOE,<br>ENVIRONMENT<br>CANADA,<br>BUSINESS/INDUSTRY   | DEPENDS ON<br>PROJECT  |
|   | OPTION 1:<br>INDUSTRIAL<br>SEWAGE<br>TREATMENT<br>PLANT                      | 6    | •SEGREGATES INDUSTRIAL<br>FLOW FROM RESIDENTIAL/<br>COMMERCIAL SEWAGE AND<br>THEREFORE ALLOWS FOR<br>GROWTH OF TOWN                                    | //   | •REQUIRES TERTIARY<br>TREATMENT AND<br>ADDITIONAL DIFFUSER TO<br>THE BAY  | TOWN, MOE,<br>INDUSTRIAL USERS  | \$21.3 Million   |
|   | OPTION 9:<br>PRETREATMENT  | 6    | •REDUCES P LOAD TO THE<br>STP<br>•REDUCES COST OF<br>TREATING WASTEWATER<br>•HELPS INDUSTRY MEET OR<br>BETTER THE SEWER USE BY-<br>LAW                 | ✓  | •DOES NOT REDUCE P<br>LOAD TO HARBOUR<br>•REQUIRES EXPANSION OF<br>PRETREATMENT FACILITY<br>AT NACAN AND COOPER-<br>ATION OF INDUSTRY             | INDUSTRY  | \$2.1 Million  |
|   | OPTION 6:<br>NEW<br>TECHNOLOGIES<br>AT INDUSTRY                              | 6    | •REDUCES P LOAD TO THE<br>STP<br>•REDUCES HYDRAULIC LOAD<br>TO THE STP<br>•HELPS INDUSTRY MEET OR<br>BETTER MISA REQUIREMENTS                          | //   | •CONTINGENT ON THE<br>DEVELOPMENT OF NEW<br>TECHNOLOGY  | INDUSTRY  | DEPENDS ON<br>PROJECT  |
|   | OPTION 3:<br>TERTIARY<br>TREATMENT AT<br>EXISTING STP                        | 6    | •BRINGS HARBOUR WATER TO<br>MOE GUIDELINES OR BETTER<br>•NO NEED FOR OPTION 7 IF P<br>IN STP EFFLUENT IS<br>SUFFICIENTLY REDUCED BY<br>OTHER OPTIONS   | ///  | •EXPANSION MAY REQUIRE<br>FILLING INTO HARBOUR OR<br>EXCAVATING HARBOURVIEW<br>PARK WHICH IS A LANDFILL<br>SITE                                   | TOWN, MOE   | \$6.3 - \$15 Million   |
| LOSS OF FISH AND<br>WILDLIFE HABITAT/<br><br>SUSTAINABLE<br>LEVELS OF FISH<br>AND WILDLIFE  | OPTION 10:<br>WETLAND<br>PRESERVATION  | 7    | •MAINTAINS HARBOUR<br>WETLAND AREAS<br>•PRESERVES EXISTING<br>HARBOUR WETLAND AREAS  | //<br>///                                      | •CONSTRAINS<br>DEVELOPMENT<br>•REQUIRES OFFICIAL PLAN<br>AMENDMENT  | TOWN, MINISTRY OF<br>NATURAL RESOUR-<br>CES, DEPARTMENT<br>OF FISHERIES AND<br>OCEANS                   | COST TO TOWN<br>OF AMENDING<br>OFFICIAL PLAN   |
|   | OPTION 11:<br>HABITAT<br>REHABILITATION                                      | 8    | •EXPANDS FISH AND WILDLIFE<br>HABITAT FOR NATURE<br>OBSERVATION AND SPORT<br>FISHING   | ////   | •COULD EFFECT ON-SHORE<br>DEVELOPMENT<br>•REQUIRES OFFICIAL PLAN<br>AMENDMENT   | TOWN, DEVELOPERS,<br>GRANTS FROM<br>GOVERNMENT<br>AGENCIES  | \$2,000 / METRE OF<br>SHORELINE, COST<br>TO TOWN OF AM-<br>ENDING OFFICIAL<br>PLAN; \$500,000 for<br>Black Ash Creek |

<sup>1</sup>Environment Canada Great Lakes Cleanup Fund Sediment Removal Demonstration Project

<sup>2</sup>Being implemented with the Town of Collingwood, MOE MISA, and Environment Canada with the Wastewater Technology Centre

<sup>3</sup>To be implemented with the Town's Waterfront Master Plan, or as necessary pending results of Option 5

<sup>4</sup>Ongoing program, to be maintained and enhanced

<sup>5</sup>Implementation dependent on suitability of technologies and water quality results from implementation of Option 5, 7, 27

<sup>6</sup>Long-term strategy to be evaluated pending results of short-term actions and Town expansion

<sup>7</sup>Wetland is currently zoned protected, require continued protection

<sup>8</sup>Amendment to Official Plan required to ensure fish and wildlife habitat are rehabilitated, where possible, in conjunction with future development, Black Ash Creek Project underway

#### OPTION 14:

#### CONFINED STORAGE OF SEDIMENT

**DESCRIPTION:** The confined disposal storage facility is currently located at the harbour mouth near the grain elevators. There is still storage space available for an estimated 10,000 m<sup>3</sup> of sediment. The Great Lakes Cleanup Fund sediment removal program could opt for Collingwood Harbour as a demonstration site for new removal technologies, and prompt the removal of sediment in the southeast end of the harbour, given the establishment of appropriate participants.

**COST:** \$400,000 for the removal of 1000 cubic metres, \$150,000 for the next 3000 cubic meters, and \$200,000 for the remaining volume necessary to fill the confined disposal facility

#### OBJECTIVES

Demonstrating removal technologies would provide some or all of the remaining sediment required to bring the confined disposal facility to capacity so that it may be capped. While currently isolated from the harbour turning basin, removal of sediment from the Shipyard dry dock and launch basin would prevent the possibility of contaminants entering the harbour's waters if sediment were disturbed due to future proposed uses.

#### DISCUSSION

Collingwood Harbour has been proposed as a site for the demonstration of new technologies designed to remove contaminated sediment. Under the Great Lakes Clean-up Fund, Environment Canada has selected four test areas, one of which is Collingwood. The proposal involves pumping 1000 cubic metres of soft material from the harbour. The material will be placed in the confined disposal facility (CDF) adjacent to the Collingwood Terminals. In Phase Two another 3000-6000 cubic meters of material will be removed and any additional sediment needed to fill the CDF will be dredged from the east end of the harbour. The former activity will be carried out through a partnership of government agencies and local interests. The latter activity is contingent upon the level of participation of CSL, Transport Canada and The Town of Collingwood.

The technology selected should the demonstration be approved is the Pneuma Pump developed in Italy. Under the federal Clean-up fund requirements, the Government of Canada stipulates that the demonstration equipment is to be built in Canada. As well, there have been initial discussions with the US Army Corps of Engineers about participating in new technologies for capping the Collingwood CDF.

**PAC RECOMMENDATION:** 100% consensus to include option 14 in the strategy.

**STATUS:** Participation in implementing Option 14 is in the process of being negotiated.



**OPTION 5:**

**OPTIMIZE OPERATIONS AT THE  
EXISTING STP**

**DESCRIPTION:** As a result of the STP process audit completed in November, 1991, a project to address enhanced P removal by multi-point alum addition, automated alum dosage control and raw and biological solids inventory control through computer-assisted operation has received support from MOE-MISA, Environment Canada's Cleanup Fund, and the Town of Collingood.

**COST:** \$400,000 - \$1.1 MILLION

**OBJECTIVES:**

Computerizing the control of processes such as aeration and phosphorus precipitation could enhance the cost and energy efficiency of sewage treatment at the STP, postponing or eliminating the need for further expansion of existing facilities.

**DISCUSSION:**

Optimize is meant to include both the human (e.g. improve plant operator's skills) and technological (e.g. computer programming) components. It was also noted that optimization could help eliminate the phosphorus peaks that occur on occasion and have adverse effects on water quality in the harbour. The STP process audit completed in November 1991 resulted in recommendations that aspects of the operations be computerized.

It was advanced that this option by itself, under normal conditions could restore water quality and beneficial uses. However, proposed developments in the Town will likely lead to increased flows that may result in exceeding the P loading requirement set by the RAP. Even though the cost of servicing future development is covered, in part, by lot levies, additional actions are necessary for delisting.

**PAC RECOMMENDATION:** 100% consensus to include option 5 in the strategy.

**STATUS:** Option 5 is in the process of being implemented.

**Options 7:**

**EXTEND THE OUTFALL WITH  
DIFFUSER INTO THE HARBOUR**

**DESCRIPTION:** The existing outfall for STP effluent is located essentially at shore, in a small sheltered embayment behind the breakwater in the southeast corner of the harbour. This option proposes to extend the existing outfall piping to an area within the harbour where the flow of water is conducive to rapid assimilation of phosphorus, and where impacts on Nottawasaga Bay are insignificant.

**COST: \$2.1 MILLION**

**OBJECTIVES**

Extending the outfall further into the harbour with a diffuser would enhance the rate at which STP effluent is mixed and assimilated.

**DISCUSSION:**

- this is a dilution solution
- opposition to the option as a stand alone approach
- must not be a stand alone option, but needs to be carried out in conjunction with other options
- the existing location of the STP outfall would not be approved by current MOE requirements, extending the outfall with a diffuser conforms better with MOE specifications
- the option can get the same results as building a new STP, but at less cost
- the option is effective in restoring water quality (for delisting)
- modelling results (of 3 outfall locations) showed a reduction in the effects of the harbour on the Bay waters (phosphorous and bacteria) by extending the pipe within the Harbour, as compared with leaving the outfall in its present location
- make sure the pressure for reducing the phosphorus loading to the Harbour is not reduced because the outfall is further out
- establish Harbour phosphorus loading goals, not flow concentration goals
- the STP's outfall may have to be moved anyway if the proposed Harbour Marina is built and public launch is reconfigured
- implement option 5 before extending the pipe

**PAC RECOMMENDATION:** 100% consensus to include option 7 in the strategy.

**STATUS:** Could be implemented in conjunction with the Town's Waterfront Master Plan, need for this option to be evaluated pending results of Option 5.

## **OPTION 27:**

### **WATER CONSERVATION**

**DESCRIPTION:** Decreasing residential use of water would involve continuing public education programs, promoting water conserving products, and working with industry on process changes to facilitate reductions in water use.

**COST:** Dependent upon water conservation initiatives; long term cost savings to the Town

### **OBJECTIVES**

Reducing water consumption would cut down on the volume of waste water treated by the sewage treatment plant. As a result, the probability of upset due to hydraulic overload would be reduced. In addition, reduced water consumption would mean that local public utilities would not have to treat as much water to send to households and commercial and industrial institutions, resulting in less expensive overall water treatment and leaving room for further expansion of services.

### **DISCUSSION**

- this option is already being implemented (shower heads, toilet dams, industry action)
- if effluent quality remains constant, reducing the flow to the STP reduces the mass of pollutants entering the Harbour
- this option should include an educational component
- action should read "Continue to implement Option 27
- an ascending water rate schedule should be considered during implementation
- when implementing this option, do not go the punitive route, stress education, give a bonus to those who conserve

An extremely important concept which related to reducing the total phosphorus loading to the harbour was discussed and clarified. The concentration of phosphorus (P) in the flow to the STP is not critical to the loading (amount) that reaches the Harbour. This is because the STP is capable of reducing different influent phosphorus concentrations to

the plant, to the same concentration in effluent (e.g. 0.3mg/L). Water conservation can reduce the hydraulic flow, which, when multiplied by the concentration in effluent, determines the total load of P to the harbour. If effluent concentrations remain constant, the hydraulic flow to the STP determines the total amount of phosphorus discharged to the Harbour, water conservation efforts are critical from the point of view of meeting the RAP's P load requirement (2760 kg/year) and delisting criteria.

The P concentrations in the flow to the STP from industrial or residential uses determines how expensive it is to reduce the concentration in effluent to a required concentrations (e.g. 0.3mg/L). The greater the amount of chemicals added to precipitate P, the greater the generation of sludge at the STP. Hence, while Option 24 (Control Detergents) and Option 25 (Control Fertilizers) are not critical to delisting, they do have cost saving ramifications for the town.

**PAC RECOMMENDATION:** 100% consensus to include option 27 with an educational component in the strategy.

**STATUS:** Program is ongoing, educational component being implemented by the PUC and the Public Awareness Subcommittee, PUC working in conjunction with local industries.

**OPTION 6:**

**INCORPORATE NEW (PROVEN)  
TECHNOLOGY INTO THE STP**

**DESCRIPTION:** New technologies for effluent polishing are to be investigated as they emerge. Among the possible new technologies are constructed wetlands and solar aquatics.

**COST:** Dependent on specific project

**OBJECTIVES**

New technologies could enhance the efficiency of the sewage treatment plant and thereby reduce the amount of phosphorus and other contaminants entering the harbour's waters.

**DISCUSSION**

The wording of this option was amended at the Delisting Strategy Workshop from that in *Making Choices* ("Develop New Innovative Technology for the STP") to "Incorporate New (Proven) Technology into the STP." The group agreed that only proven technologies should be used at the sewage treatment plant.

**PAC RECOMMENDATION:** 100% consensus to include revised option 6 in the strategy.

## SEQUENCE OF REMEDIAL ACTION IMPLEMENTATION

**THERE WAS 100 % CONSENSUS FOR THE FOLLOWING OPTION PRIORITY:**

**OPTION 5 (STP Optimization) AND 27 (Water Conservation) first, then:  
OPTION 7 (Modify the STP Outfall), then:  
OPTION 6 (Incorporate New Technology)**

*In considering the long-term strategy (Implement either Option 1, 9, 3 or 8), the discussion included the following points:*

- to be delisted we must insure that once water quality and beneficial uses are restored, efforts to protect the harbour ecosystem will continue
- Stage 2 will contain a monitoring program to track the effectiveness of Options 5 and 27, 7 and 6
- after the RAP is written, an Implementation Committee (Action Team) will form
- the Action Team, in consultation with the Public Accountability Committee will be responsible for reviewing which of the long-term options is appropriate

**There was 100% consensus that the selection of either Options 1 (Industrial sewage treatment plant), 9 (expanded Industrial pretreatment), 3 (tertiary treatment), or 8 (new technologies at industry) would wait until the short-term strategy has been assessed, and that there would be a public consultation program associated with the selection process.**

**There was 100% consensus that the long-term options would be considered after the effectiveness of Options 5, 27, 7 and 6 are assessed and within two years after the implementation of Option 7.**



**OPTION 10:**

**WETLANDS PRESERVATION**

**DESCRIPTION:** Under the Planning Act, future land use planning policies and development applications, as well as other projects affecting wetlands in Ontario, will be prohibited if they result in a loss of wetland function or result in a loss of wetland area, in provincially significant wetlands. The Town's Official Plan recognized the requirement to preserve wetland areas. Further actions include protecting of the wetland complex against the invasion of Purple Loosestrife (*Lythrum salicaria*).

**COST:** Staff time dedicated to review of development proposals, and to Purple Loosestrife Control Program.

**OBJECTIVES:**

The preservation of wetlands contributes to sustaining fish and wildlife populations within the harbour area, which is one of the Public Advisory Committee's goals. Preserved wetlands also ensure that the harbour can continue to be used as recreational area for fishing and nature observation.

**DISCUSSION**

- revise the wording of the option to reflect present municipal practice (through the Town's Official Plan classification of the wetland as Environmental Protection, and the Waterfront Master Plan) and to read: "maintain" Option 10: Wetlands Preservation"
- present Official Plan does not have the power to protect wetlands
- a presentation is to be made to the Collingwood Planning Committee March 1992, to ammend the OP to include protection and enhancement of fish and wildlife habitat in the consideration of development proposals.

**PAC RECOMMENDATION:** 100% consensus to include the revised option 10 in the strategy

**STATUS:** Wetland zoned protected, presentation to Council on OP ammendment March 23, 1992



**OPTION 11:**

**WHEN THE OPPORTUNITY ARISES,  
IMPLEMENT HABITAT  
REHABILITATION**

**DESCRIPTION:** Shallow water areas may be created to provide a productive littoral zone for fish and wildlife. Near-shore development could include reip-rap or armour stone shore protection that will in turn provide cover to fish and other aquatic organisms. Enhancement of fish habitat within Black Ash Creek will contribute to reaching the proposed delisting targets, as will the control of Purple Loosestrife.

**COST:** Approximately \$4,000 per meter of shoreline within the harbour, assuming 8 m width and 2 m depth. Black Ash Creek Rehabilitation Project est. \$250,000 - \$500,000

**OBJECTIVES**

Rehabilitation of aquatic habitat would continue to improve fish and wildlife populations in the harbour. It would also ensure the PAC's Use Goal for the harbour as an area for nature observation.

**DISCUSSION**

- developers should be required to undertake habitat rehabilitation
- do not make this option an obligation
- habitat rehabilitation can provide permanent cover for invertebrates, fish, and wildlife that would enrich the harbour ecosystem
- strengthen the wording of the option to reinforce habitat rehabilitation for fish and wildlife

It was agreed that in the description of Option 11 on page 57 of "Making Choices", the fifth sentence would be revised to read: "All development within the harbour should have regard for the protection of existing habitat and the provision of more habitat, and the Official Plan reflect that goal."

**PAC RECOMMENDATION:** 100% consensus to include option 11 (as revised) in the strategy.

**STATUS:** Black Ash Creek project underway, OP ammendment approved by Council April 1992.

**ADDITIONAL REMEDIAL ACTIONS TO  
BE INCLUDED IN THE COLLINGWOOD  
HARBOUR RAP**

The additional "Remedial Actions To Be Included In The Collingwood Harbour RAP" were identified as desirable, but not required to achieve delisting, and are as follows:

combine OPTION 13: Vegetated Buffer Zone along Black Ash Creek<sup>1</sup> and Canals<sup>2</sup> with  
OPTION 26: Agricultural Programs (underway - Rehabilitation of BAC)

Option 17: Environmental Playground (construction in progress - ENVIROPARK)

Option 18: RAP Communications Plan (ongoing)

Option 19: Environmental Library (ongoing)

Option 20: RAP teaching/information package (completed)

Option 21: RAP Bulletin Board

Option 22: Mariner Education Package (ongoing)

Option 23: Information for Ice Fisherman (ongoing)

Option 24: Control Detergents

Option 25: Control Fertilizers

Option 28: Composting and Water Conserving Toilets

Option 29: Restrict the Effects of Discharge of Grey Water From Boats

**THERE WAS 100% CONSENSUS TO INCLUDE THESE ADDITIONAL REMEDIAL  
ACTIONS IN THE COLLINGWOOD HARBOUR RAP.**

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<sup>1</sup>being implemented

<sup>2</sup>proposed activity

# **RATIONALE FOR EXCLUDING OPTIONS FROM THE DELISTING STRATEGY**

| OPTION  | REASONS FOR OMISSION  |
|---|---|
| OPTION 2:<br>SEWAGE TREATMENT PLANT<br>DETENTION POND     | <ul style="list-style-type: none"> <li>• POND IN HARBOURVIEW PARK WOULD DETRACT FOR AESTHETIC ENJOYMENT OF THE AREA</li> <li>• PROPOSED LOCATION IS A FILLED WASTE DISPOSAL SITE, EXCAVATION DIFFICULT</li> <li>• DOES NOT CONTRIBUTE SIGNIFICANTLY TO WATER QUALITY IMPROVEMENTS IF OPTIONS 5 AND 7 ARE IMPLEMENTED</li> </ul>                           |
| OPTION 4:<br>MOVE THE SEWAGE TREATMENT<br>PLANT           | <ul style="list-style-type: none"> <li>• IS INCONSISTENT WITH USE GOAL</li> <li>• TECHNICALLY DIFFICULT</li> <li>• COSTLY</li> <li>• OTHER REMEDIAL ACTIONS WILL RESTORE WATER QUALITY</li> </ul>   |
| OPTION 12:<br>BLACK ASH CREEK DETENTION POND              | <ul style="list-style-type: none"> <li>• IMPROVEMENTS TO WATER QUALITY MAY BE MINIMAL</li> <li>• NOT NECESSARY IF OPTIONS 13 AND 26 ARE IMPLEMENTED</li> <li>• DOES NOT CONTROL EROSION, THE SOURCE OF THE PROBLEM</li> </ul>   |
| OPTION 15:<br>INCREASE EXCHANGE BY OPENING<br>AN EAST GAP | <ul style="list-style-type: none"> <li>• STRICTLY A DILUTION SOLUTION</li> <li>• IS INCONSISTENT WITH USE GOAL SINCE IT COULD ADVERSELY EFFECT NOTTAWASAGA BAY AND NEARSHORE SPAWNING BEDS</li> <li>• NOT NECESSARY IF OPTIONS 5, 27 AND 7 ARE IMPLEMENTED</li> <li>• FUTURE USE OF CN AND CSL PROPERTIES MAY BE INCOMPATABLE WITH THIS OPTION</li> </ul> |
| OPTION 16:<br>MONITOR (status quo)                        | <ul style="list-style-type: none"> <li>• DATA FROM 1989 TO 1991 SUGGEST THAT FURTHER RECOVERY OF THE HARBOUR WOULD BE MARGINAL IF NO TECHNICAL OPTIONS WERE IMPLEMENTED</li> </ul>  |

**STAGE 2 CONSIDERATION OF ISSUES RAISED IN REVIEW OF THE  
COLLINGWOOD HARBOUR RAP STAGE 1 REPORT**

The following discussion addresses the comments raised in the review of the Collingwood Harbour RAP Stage 1 document, and provides an update on current environmental conditions in summary form.

1. **HAVE THE ENVIRONMENTAL PROBLEMS IN THE AOC BEEN ADEQUATELY DESCRIBED, INCLUDING IDENTIFYING BENEFICIAL USES IMPAIRED, THE DEGREE OF IMPAIRMENT AND THE GEOGRAPHIC EXTENT OF SUCH IMPAIRMENT?**

IJC: NO. ALTHOUGH 1989 WORK IS EXPECTED TO PROVIDE MUCH OF THE NEEDED INFORMATION.

| BENEFICIAL USE                                | IJC REVIEW COMMENT  | STAGE 2 FINDINGS  |
|---|---|---|
| RESTRICTIONS ON FISH AND WILDLIFE CONSUMPTION | IMPAIRMENT IS MARGINAL. FURTHER WORK IS NEEDED TO DETERMINE IF Hg CONSUMPTION ADVISORIES FOR THIS AOC ARE REQUIRED. DOES NOT APPEAR LIKELY THAT WILDLIFE IS BEING CONSUMED BY HUMANS, IN VIEW OF THE SMALL SIZE AND URBAN NATURE OF THE HARBOUR | NO YELLOW PERCH > 35 cm WERE CAUGHT DESPITE EFFORTS BY MOE/MNR IN 1990 AND 1991. LOCAL ANGLERS CAUGHT 3 YELLOW PERCH > 35 cm AND Hg RESIDUES WERE < 0.50 ug/g (UNRESTRICTED CONSUMPTION). Hg IN SEDIMENT IS AT DETECTION LIMIT AND CONSUMPTION ADVISORIES ARE NOT DIFFERENT FROM GEORGIAN BAY |
| TAINTING OF FISH AND WILDLIFE FLAVOUR         | THIS BENEFICIAL USE IS NOT IMPAIRED   |   |

| BENEFICIAL USE                                      | IJC REVIEW COMMENT   | STAGE 2 FINDINGS  |
|---|--|---|
| DEGRADATION OF FISH AND WILDLIFE POPULATIONS        | THIS BENEFICIAL USE IS PROBABLY IMPAIRED. REVIEWERS POINTED OUT THAT DISSOLVED OXYGEN DEPLETION, HABITAT LOSS AND THE PRESENCE OF TOXICS MAKE IT LIKELY THAT FISH POPULATIONS ARE IMPAIRED | HARBOUR WATERS ARE NEARLY SATURATED WITH OXYGEN, INCLUDING BOTTOM WATERS. MNR SURVEYS REVEALED PROVINCIALLY SIGNIFICANT SPAWNING HABITAT IN THE COLLINGWOOD WETLAND COMPLEX, AND THE PRESENCE OF PROVINCIALLY SIGNIFICANT AVIAN SPECIES. WATER AND SEDIMENT QUALITY SURVEYS IN 1989, 1990 AND 1991 SHOWED THAT TRACE ORGANIC COMPOUNDS WERE AT OR BELOW DETECTION LEVELS, AND THAT METALS WERE NOT PRESENT IN TOXIC CONCENTRATIONS. (SECTION 2.2) |
| FISH TUMORS OR OTHER DEFORMITIES                    | THIS BENEFICIAL USE IS NOT IMPAIRED  |   |
| BIRD OR ANIMAL DEFORMITIES OR REPRODUCTION PROBLEMS | NO IMPAIRMENTS ARE REPORTED, BUT EXCEEDANCES IN EMERALD SHINERS OF THE AGREEMENT OBJECTIVE OF 0.1 ug/g OF PCBS...SHOULD BE ADDRESSED IN FUTURE MONITORING                                  | PCB LEVELS IN SHINERS SAMPLED IN 1989 AND 1990 WERE 0.089 AND 0.086 ug/g, RESPECTIVELY, BELOW THE 0.1 ug/g GUIDELINE FOR PROTECTION OF AQUATIC LIFE. PAH RESIDUES IN 1990 SHINERS WERE NO DIFFERENT FROM COLLECTIONS FROM OTHER LOCATIONS IN THE GREAT LAKES BASIN. PCBS IN SEDIMENT IN 1990 AND 1991 WERE BELOW DETECTION (< 0.020 ug/g) (SECTION 2.2)   |

| BENEFICIAL USE                       | IJC REVIEW COMMENT   | STAGE 2 FINDINGS   |
|--------------------------------------|--|--|
| DEGRADATION OF BENTHOS               | THIS BENEFICIAL USE IS IMPAIRED. AS THE RAP IS FURTHER DEVELOPED, IT IS ESSENTIAL THAT OBJECTIVES BE SET IN TERMS OF EXPECTED RECOVERY OF THE BENTHIC COMMUNITY. EVEN IF DISSOLVED OXYGEN LEVELS IN THE WATER DON'T REACH ZERO, DISSOLVED O PROBLEMS IN THE SEDIMENT MAY IMPACT THE BENTHOS. | BENTHIC COMMUNITY ENUMERATION IN 1991 REVEALED THE PRESENCE OF MESOTROPHIC SPECIES, INCLUDING MAYFLY NYMPHS. TARGET COMMUNITIES ARE PROVIDED IN THE STAGE 2 REPORT. CHRONIC SEDIMENT BIOASSAYS DEMONSTRATED THAT THERE WAS NO GROWTH INHIBITION IN TEST ORGANISMS EXPOSED TO COLLINGWOOD HARBOUR SEDIMENT, AS COMPARED TO ORGANISMS IN REFERENCE SEDIMENT (SECTION 2)  |
| RESTRICTION ON DREDGING ACTIVITIES   | THIS BENEFICIAL USE IS IMPAIRED. THE GEOGRAPHIC EXTENT OF PCB-CONTAMINATED SEDIMENTS SHOULD BE DESCRIBED TO AID FUTURE PLANNING AND COSTING OF REMEDIAL ACTIONS.   | IN 1990 AND 1991, PCB CONCENTRATIONS IN SEDIMENT WERE BELOW DETECTION. A SINGLE STATION IN THE HARBOUR DEPOSITIONAL ZONE, OUTSIDE OF THE TURNING BASIN HAS Zn, Pb AND Cu MARGINALLY ABOVE THE OPEN WATER DISPOSAL GUIDELINE. <i>IN SITU</i> AND LABORATORY BIOASSESSMENTS FOUND NO TOXICITY ASSOCIATED WITH SEDIMENT FROM THIS AND ALL OTHER STATIONS, AND BIOACCUMULATION WAS NOT DIFFERENT FROM CONTROLS. A SEDIMENT REMOVAL DEMONSTRATION PROJECT COULD REMOVE SEDIMENT FROM THIS LOCATION, AS DESCRIBED IN THE STAGE 2 REPORT. |
| EUTROPHICATION AND UNDESIRABLE ALGAE | THIS BENEFICIAL USE IS IMPAIRED  | A STRATEGY TO ACHIEVE A RESTORATION TARGET OF 0.020 ug/L P IN THE HARBOUR IS OUTLINED IN THE STAGE 2 REPORT  |
| RESTRICTION ON DRINKING WATER...     | THIS BENEFICIAL USE IS NOT IMPAIRED  |  |



| BENEFICIAL USE                            | IJC REVIEW COMMENT   | STAGE 2 FINDINGS   |
|---|--|--|
| BEACH CLOSING                             | THIS BENEFICIAL USE IS IMPAIRED. THE BEACH CLOSING CATEGORY SHOULD BE VIEWED AS INCLUDING VARIOUS DEGREES OF RECREATIONAL BODY CONTACT AS WELL AS SWIMMING. SURVEY RESULTS FROM 1989 SHOW TWO EXCEEDANCES OF THE PROVINCIAL LIMIT. MONITORING SHOULD BE CONTINUED TO DETERMINE THE DEGREE OF ATTAINMENT DURING WETTER CONDITIONS | THE PAC USE GOAL IDENTIFIES THAT SWIMMING SHOULD NOT OCCUR IN COLLINGWOOD HARBOUR DUE TO DANGER ASSOCIATED WITH BOAT TRAFFIC, BUT THAT THE BACTERIAL OBJECTIVE BE MET WITH THE EXCEPTION OF 24 HOURS FOLLOWING A MAJOR STORM EVENT. NO SAMPLES COLLECTED IN 1990 AND 1991 EXCEEDED THE BACTERIAL OBJECTIVE FOR BODY CONTACT RECREATION |
| DEGRADATION OF AESTHETICS                 | THIS BENEFICIAL USE IS IMPAIRED  | A STRATEGY TO IMPROVE AESTHETICS IS INCLUDED IN THE STAGE 2 REPORT   |
| ADDED COSTS TO AGRICULTURE OR INDUSTRY    | THIS BENEFICIAL USE IS NOT IMPAIRED  |  |
| PHYTOPLANKTON AND ZOOPLANKTON POPULATIONS | THIS BENEFICIAL USE IS PROBABLY IMPAIRED. EUTROPHIC CONDITIONS MAKE IT PROBABLE THAT IMPAIRMENT EXISTS AND THUS DATA SHOULD BE GATHERED AND PRESENTED  | PHYTOPLANKTON BIOASSAYS REVEALED NO TOXICITY. MEAN PHOSPHORUS CONCENTRATIONS IN THE HARBOUR FOR THE ICE FREE PERIOD ARE BELOW 0.020 ug/L, AND EUTROPHIC CONDITIONS ARE NOT PERSISTENT.   |

| BENEFICIAL USE                    | IJC REVIEW COMMENT  | STAGE 2 FINDINGS  |
|-----------------------------------|---|---|
| LOSS OF FISH AND WILDLIFE HABITAT | THIS BENEFICIAL USE IS IMPAIRED. OBVIOUSLY, HABITAT WAS LOST WHEN THE DOCKS, CONDOMINIUMS AND MARINAS WERE BUILT; AND MORE WILL BE LOST AS FURTHER DEVELOPMENT OCCURS. A RELATED HABITAT ISSUE MAY BE THE PROPOSED PLANS TO "WIDEN AND BERM BLACK ASH CREEK". WHETHER THE PROJECT WILL ENHANCE SPAWNING HABITAT, LEAVE IT DEGRADED, OR DEGRADED FURTHER IS NOT CLEAR. | DOCKS, CONDOMINIUMS AND MARINAS WERE BUILT IN CONSULTATION WITH MNR TO PROVIDE HABITAT WHERE IT HAD BEEN DESTROYED DUE TO PREVIOUS HARBOUR USES. FUTURE DEVELOPMENT WILL CREATE, RATHER THAN DESTROY HABITAT, GIVEN THAT THESE PROPERTIES CURRENTLY HAVE HARD, VERTICAL SHORELINES AND NO COVER FOR FISH AND WILDLIFE. (DETAILED IN THE STAGE 2 REPORT). THE BLACK ASH CREEK PROJECT INCLUDES CONSIDERATION OF EROSION CONTROL AND THE CREATION OF SPAWNING HABITAT WHERE NONE CURRENTLY EXISTS (DETAILED IN THE STAGE 2 REPORT). |

2. *HAS THERE BEEN IDENTIFICATION OF SPECIFIC OBJECTIVES OF THE GLWQA THAT ARE EXCEEDED TO THE EXTENT THAT SUCH FAILURE HAS CAUSED OR IS LIKELY TO CAUSE IMPAIRMENT OF BENEFICIAL USES, INCLUDING THE AREA'S ABILITY TO SUPPORT AQUATIC LIFE?*

IJC: YES. ALTHOUGH A CLEAR COMPARISON WITH AGREEMENT OBJECTIVES IS NOT PROVIDED...IN PARTICULAR, THE RAP SHOULD SUMMARIZE AND IDENTIFY EACH OBJECTIVE THAT IS EXCEEDED AND SHOULD COMPARE THE FISH DATA TO AGREEMENT OBJECTIVES FOR THE PROTECTION OF FISH AND WILDLIFE.

RAPI THE COLLINGWOOD HARBOUR STAGE 2 REPORT PRESENTS THE 1989 AND 1990 FISH DATA AND THE GLWQA OBJECTIVES.

3. *HAVE THE CAUSES OF THE USE IMPAIRMENTS BEEN IDENTIFIED, INCLUDING A DESCRIPTION OF ALL KNOWN SOURCES OF POLLUTANTS INVOLVED AND AN EVALUATION OF OTHER POSSIBLE SOURCES?*



IJC: NO. THE LIKELY CAUSES OF THE IMPAIRMENTS HAVE BEEN WELL PRESENTED, PRIMARILY AS RESULTING FROM PAST ACTIVITIES, BUT QUESTIONS REMAIN AS TO WHETHER THE CAUSAL PARAMETERS ARE BEING DEPOSITED FROM ACTIVE SOURCES, AND WHETHER ALL SOURCES HAVE BEEN ADEQUATELY IDENTIFIED... BENTHIC INVERTEBRATES, A MAJOR FOOD OF YELLOW PERCH, CONTAIN LEVELS OF MERCURY THAT ARE HIGHER THAN THOSE REPORTED IN HARBOUR SEDIMENTS...IT SEEMS UNLIKELY, THEREFORE, THAT MERCURY IN PERCH CAN BE ATTRIBUTED TO EXTERNAL SOURCES AS SUGGESTED IN THE RAP. THE 1989 RESULTS SHOULD PROVIDE FURTHER INSIGHT ON CURRENT LOADINGS AND SOURCES.

RAP: MERCURY CONCENTRATIONS IN HARBOUR SEDIMENT ARE AT OR BELOW THE DETECTION LEVEL. NO MERCURY WAS DETECTED IN STP EFFLUENT, FROM STORM SEWER INFLOWS, OR BLACK ASH CREEK. MUSSEL BIOMONITORS DEPLOYED IN 1990 DID NOT BIOACCUMULATE Hg. YELLOW PERCH CAUGHT IN THE HARBOUR RESIDE IN GEORGIAN BAY AS HARBOUR WATER TEMPERATURES FLUCTUATE, AND Hg RESIDUES IN YELLOW PERCH ARE FOUND THROUGHOUT GEORGIAN BAY.

THE IJC REVIEW CONTINUES, WITH A SERIES OF "UNANSWERED QUESTIONS ON SOURCES"

*REGARDING THE "ON-SITE DUMPS";* THE STAGE 2 REPORT PROVIDES DATA ON STORM SEWER STUDIES TO ADDRESS CONTAMINANTS ASSOCIATED WITH THE INDUSTRIAL LANDFILL SITE.

*REGARDING AGRICULTURAL RUNOFF;* AGRICULTURAL INPUTS OF PESTICIDES AND NUTRIENTS WERE MONITORED IN 1989, 1990 AND 1991 AND NO PESTICIDES WERE DETECTED IN THE TRIBUTARIES DRAINING THE AGRICULTURAL WATERSHED REACHES, AS DETAILED IN THE STAGE 2 REPORT, AND NUTRIENT INPUTS ACCOUNTED FOR LESS THAN 5% OF THE TOTAL HARBOUR LOAD.

*REGARDING THE STP OVERFLOW AND BYPASSES;* THE STP BYPASS REQUIRES MANUAL OPERATION, AND NO BYPASSES WERE RECORDED IN THE YEARS OF MONITORING.

**I. THE COLLINGWOOD HARBOUR RAP**

**THE RAP PROCESS AND PUBLIC INVOLVEMENT PROGRAM**

## **I. THE COLLINGWOOD HARBOUR RAP**

*The Collingwood Harbour Remedial Action Plan is now at the stage where preferred actions to redress water-quality problems and restore beneficial uses of the harbour have been selected. Indeed, some remedial actions are already under way. But the process of deciding on ways to clean up and protect Collingwood Harbour's waters has been an extensive one, involving several years of legislative, organizational and information-gathering efforts and a far-reaching program of public consultation.*

### **1.1 DESIGNATION OF COLLINGWOOD HARBOUR AS AN AREA OF CONCERN**

In 1985, Ontario and eight states, along with the Canadian and U.S. federal governments, made a commitment to improving environmental conditions in areas of the Great Lakes where water quality had been severely degraded. The Great Lakes Water Quality Board called for the identification of Areas of Concern, or AOCs, where water pollution is severe enough to endanger wildlife populations or impair beneficial water uses; it also called for the development of Remedial Action Plans (RAPs) to improve water-quality conditions in each Area of Concern. In 1987, the concerned parties signed an amendment to the Great Lakes Water Quality Agreement (GLQWA). That amendment included Annex 2 of the GLQWA. Annex 2 lists 14 impaired uses in the identification of Areas of Concern. Among those are restrictions on fish and wildlife consumption, declines in fish and wildlife populations, eutrophication, problems with drinking water, beach closings, degraded fish and wildlife habitat, aesthetic deterioration and dredging restrictions.

The Ontario Ministry of the Environment had reported in 1977 to the International Joint Commission (IJC), an independent body established under the Canada-U.S. Boundary Waters Treaty to expedite co-operation in matters concerning boundary waters, that Collingwood Harbour was an environmental problem area due to nuisance algal growth and occasional high levels of bacteria. In accordance with the GLWQA, Ontario identified the harbour as one of 17 Areas of Concern in the province. The water-quality problem that resulted in the listing of Collingwood Harbour as an AOC was nuisance algal growth. Subsequent tests identified elevated bacterial levels, restrictions on dredging activities due to sediment contamination, restrictions on the consumption of fish and degradation of the harbour's aesthetics (see Table 1.1).

## **1.2 CREATION OF COLLINGWOOD HARBOUR RAP**

Environment Canada and Environment Ontario responded to the listing of Collingwood Harbour as an Area of Concern in 1986 by instituting a Remedial Action Plan and setting up a RAP team, which comprised representatives from Environment Ontario, Environment Canada and the Ontario Ministry of Natural Resources. The goal of the RAP is vital to the future of Collingwood Harbour: to improve the harbour's water quality and restore or maintain the beneficial uses that the harbour supports.

Under the RAP mandate given under Annex 2 of the GLWQA, the Collingwood Harbour RAP is required to include:

**Table 1.1: Contents of a Remedial Action Plan**

- |       |   |
|-------|---|
| i)    | A definition and detailed description of environmental problems in the AOC, including a definition of the beneficial uses that are impaired, the degree of impairment and the geographic extent of such impairment; |
| ii)   | A definition of the causes of the use impairment, including a description of all known sources of pollutants involved and an evaluation of other possible sources;  |
| iii)  | An evaluation of remedial measures already in place;  |
| iv)   | An evaluation of alternative remedial measures to restore beneficial uses;  |
| v)    | A selection of additional remedial measures to restore beneficial uses, and a schedule for their implementation;  |
| vi)   | An identification of the persons or agencies responsible for implementation of remedial measures;   |
| vii)  | A process for evaluating remedial measure implementation and effectiveness;   |
| viii) | A description of surveillance and monitoring processes to track the effectiveness of remedial measures and the eventual confirmation of restored uses."   |

In fulfilling this mandate, the RAP is required under the GLWQA to follow what is known as an "ecosystem approach." In short, that philosophy means that whatever remedial actions are taken, they must be consistent with a respect for the entire Collingwood Harbour ecosystem, the animals, plants and people that interact with one another within a shared environment. One element of the harbour ecosystem must not be allowed to benefit at the expense of another. In this respect, the ecosystem approach forms the basis for effective long-term environmental management. It requires the RAP to take into account the effects of contamination not only on the harbour proper, but also on the surrounding watershed, and to consider possible remedial actions in light of the entire interactive area. As a result, wildlife habitat, sources of contaminants beyond the harbour, and land uses as they affect water quality, for example, also fall within the RAP's scope.

## 1.3 PUBLIC INVOLVEMENT

### 1.3 - 1 The Public Advisory Committee

Public consultation and involvement is central to the concept of the Remedial Action Plan. Indeed, the GLWQA requires each RAP to institute a program for public consultation in all of its activities. In response to the need for community involvement, the RAP Team began planning for a public involvement program in November, 1987-- shortly after its creation. Since then, public involvement in the Collingwood Harbour RAP has been both wide-ranging and enthusiastic.

Through letters, media releases, presentations and meetings in the early part of 1988, the RAP Team informed local officials and citizens with a stake in Collingwood Harbour about the RAP's mandate and public involvement program. The first RAP Newsletter, describing the RAP process and the need for public input, was distributed to all residents and businesses. In April, 1988, a public forum was held, featuring an open house that displayed RAP information and allowed the public to meet the RAP Team; afterwards, environmental conditions and the RAP's public consultation process were the subjects of a public meeting. In September, the second issue of the RAP Newsletter was released, announcing the Harbour Day events scheduled for the 10th of the month; over 300 residents attended the event, at which RAP materials were available and members of the RAP Team met with the community.

In November, 1988, the Public Advisory Committee (PAC) to the Collingwood Harbour RAP Team was formed. The PAC's task is to present to the RAP the concerns of those who have an interest in, or are most directly affected by, the harbour's water quality. In keeping with that mandate, the PAC reflects a "stakeholder" approach to involvement in the RAP, and includes representatives from local industry and business, waterfront landowners, environmental organizations, tourism agencies, recreational fishing and boating groups, labour and municipal agencies (Table 1.2). At the PAC's first meeting, the RAP Team presented information on current water-quality issues for the harbour, and the PAC worked towards the development of principles and terms of reference for the RAP. As well, the committee drafted use goals for the harbour. The third RAP Newsletter, distributed in January, 1989, announced the PAC's draft use goals. Those goals were reviewed and accepted at a public meeting held in the same month (see Section 1.6). Shortly afterwards, the PAC met for its second time, finalizing the use goals that had been approved by the public and reviewing the RAP Stage 1 report, *Environmental Conditions and Problem Definition*.

At its third meeting, held in late April, 1989, the Public Advisory Committee developed evaluation criteria for proposed remedial options (see Section 1.7) and reviewed the RAP's environmental monitoring program. During a local event known as Summerfest in August, 1989, fact sheets were distributed to the community by members of the RAP Team, and the public's responses to desired uses for the harbour were reported to the PAC. At its fourth meeting, in September, the PAC reviewed preliminary options for remedial action and discussed public involvement in the RAP. Public awareness

activities were decided upon at the next PAC meeting, in February, 1990, and some revision of goals for remedial action took place. The PAC met again in April, 1990, to discuss updates on RAP activities.



**Table 1.2**  
**Collingwood Harbour Public Advisory Committee**

|   |   |
|---|---|
| Ed Houghton<br>PAC Chairperson<br>Public Utilities Commission/<br>Chamber of Commerce | Co-Chairperson, Public Awareness Subcommittee<br>Citizen-at-large                       |
| Doug Garbutt<br>PAC Vice-Chairperson<br>Nacan Products Limited                        | Larry Hogarth<br>Collingwood Yacht Club   |
| Laurie Aaron<br>CN Realty   | Don Jaques<br>Co-Chairperson, Public Awareness Subcommittee<br>Canadian Mist Distillery |
| Ray Barker<br>Mayor, Town of Collingwood  | Jim Kilgour<br>Collingwood Collegiate Institute   |
| Ben Bennett<br>Citizen-at-large   | Debra Kuehl<br>Collingwood Public Library   |
| Jason Brearley<br>High School Student   | Lee Martin<br>Collingwood Shipyards   |
| Fred Dobbs<br>MOE/MNR/NVCA<br>Habitat rehabilitation and<br>storm water management    | Greta McGillivray<br>Senior League of Collingwood                                       |
| Peter Dunbar<br>Department of Parks, Recreation and Culture                           | Sheila Metras<br>Georgian Triangle Tourist Association                                  |
| Carl Eichenberger<br>Georgian Triangle Anglers<br>Association                         | Jack Post<br>Collingwood Naturalist Club  |
| Nancy Farrer<br>Planner, Town of Collingwood  | Sandra Rupert<br>Collingwood Terminals  |
| Don Green<br>Environmental Engineering,<br>Collingwood STP                            | Charles Sandell<br>Harbour Master   |
| Leone Hall  | George Strampel<br>Agriculture  |
|   | Wayne Wilson<br>Nottawasaga Valley Conservation Authority                               |

**Table 1.3**  
**STAGES IN COLLINGWOOD HARBOUR RAP**  
**PUBLIC INVOLVEMENT PROGRAM**

- Phase 1:** Inform and educate the community through a public consultation program, employing local newspaper, radio and television media. Create a Public Advisory Committee from a group of "stakeholders," to provide further public input and facilitate public relations (Status: PAC created November 1988).
- Phase 2:** Gather views and priorities from the community in the form of desired goals and uses for the harbour. (Status: Goals and Uses approved by PAC, January 1989.)
- Phase 3:** Determine public response to options for remedial measures to achieve use goals for harbour. Approved remedial actions will be incorporated into the Remedial Action Plan. (Status: Remedial Options Discussion Paper released to PAC, March 1991.)
- Phase 4:** Public review of Remedial Action Plan. As a result of public response, changes to RAP may be incorporated as part of an ongoing process.

In July, 1990, the PAC met for the seventh time, and received updated information on RAP activities and a draft document describing remedial options for the harbour. In September, at a special meeting, the Draft Remedial Options Document was reviewed and revised by the PAC, and in October the PAC further revised remedial options and was brought up to date on RAP activities. In February, 1991, at its tenth meeting, the PAC finalized the remedial options document and began the process of public consultation on the options. In conjunction with the RAP Team, the PAC presented the remedial options document to Collingwood Town Council in March, and in the same month an open house for public review of and comment on remedial options was held. Throughout the development of remedial options for the harbour, the PAC provided an avenue for public consultation with the RAP Team, and later played an active role in the selection of preferred remedial measures.

In June, 1991, the PAC discussed the definition of zero discharge and virtual elimination of toxic substances, and reviewed updates to technical information on remedial options. As well, the PAC discussed implementation of those remedial measures. Then, in September, the PAC's thirteenth meeting took place. At that meeting, the PAC

participated in a workshop on selection of remedial measures. The committee's formulation of long- and short-term priorities for remedial action has contributed to the RAP Team's recommendations for implementation of remedial measures, and has been taken into consideration for the development of delisting criteria. The workshop on remedial measures is largely responsible for the remedial measures in the RAP delisting strategy described in this document.

In addition to its consultative role in establishing goals for beneficial uses and evaluating and selecting remedial actions for the harbour, the PAC has also helped in publicizing RAP activities, largely through its Public Awareness Subcommittee (see Section 1.3-2). PAC members have been central in the development and distribution of RAP Newsletters, which have proven to be one of the most effective means for soliciting public involvement. PAC members have worked in conjunction with the RAP Team at events publicizing RAP activities and in communicating with the public through local media. As well, the PAC has played an active role in soliciting information from local officials, federal agencies and concerned businesses, and its members have participated in several workshops designed to co-ordinate RAP approaches among several Areas of Concern.

In future, the PAC will assist in generating support for the implementation of remedial actions and will provide a means of reporting to the community on the effectiveness of remedial measures once they are in place. And throughout the RAP process, the PAC will play a central consultative role in conjunction with the RAP team to ensure that the public continues to have an important voice in redressing the water-quality problems of Collingwood Harbour.

### **1.3 - 2 The Public Awareness Subcommittee**

As part of the process of consensus-building towards an effective and equitable Remedial Action Plan, the Public Advisory Committee's contributions have been vital in helping the RAP Team publicize its plans and activities. The formation of the Public Awareness Subcommittee in 1990 provided a means to target issues of public education. Designed to co-ordinate efforts to inform and educate the community about water-quality issues concerning the harbour, the subcommittee contributes to RAP newsletters, fact sheets and press releases to facilitate effective communication. It has also prepared and implemented education campaigns directed not only at the community at large, but also at specific groups whose actions or attitudes affect water quality in Collingwood Harbour.

The Public Awareness Subcommittee, in consultation with the PAC and RAP Team, distributed a poster on sources of pollution to all the schools in Collingwood and neighboring communities in the spring of 1991. Then, in the summer of that same year, the subcommittee initiated education programs addressing boaters and tourists, informing them about how they can reduce pollution in the harbour by adopting environmentally responsible boating and fishing practices. In the fall, the subcommittee prepared an education package for students and interested citizens, making available to schools and libraries a teaching/information package that illustrated the interaction of the human and natural ecosystems surrounding the harbour and what effect that interaction has on water quality. And in the winter of 1991 and 1992, the subcommittee addressed ice fishermen, encouraging them through newspaper articles and slogans posted in the ice-fishing area to use non-harmful products and to dispose of waste responsibly.

Many of the nontechnical options described in the RAP options discussion paper were initiatives devised by the Public Awareness Subcommittee. The Collingwood ENVIROPARK, discussed in detail in Section 3.3, was the brainchild of the subcommittee. With financial support from the Great Lakes Cleanup Fund, Environment Ontario, the Town of Collingwood and local businesses, off-site construction of the Enviropark began in the fall of 1991. Several of the subcommittee's programs are discussed in this document as remedial actions necessary for delisting the harbour as an Area of Concern or as additional options (see Sections 3.2 and 3.3).

### **1.3 - 3 The Technical Subcommittee**

In September of 1989, the RAP Team, in response to the need for public involvement in the more technical aspects of the Collingwood RAP process, met with members of the PAC who had specialized technical backgrounds. The purpose of that first meeting was to work towards the development of remedial options. The Technical Subcommittee proposed several technical remedial options, which were subsequently reviewed by the full Public Advisory Committee; many of those options were later incorporated into the discussion paper on remedial options, *Making Choices*. In September, 1991, the Technical Subcommittee worked closely with the RAP Team in the development of the delisting strategy for the harbour, which is contained in this document.



## 1.4 THE RAP PROCESS

Under Annex 2 of the GLWQA, each RAP is required to report on its progress to the International Joint Commission, which acts as an independent advisory body to RAPs in both Canada and the United States. Reports must be made to the IJC for review at three stages of the RAP process:

- i) when a definition of the problem has been completed;
- ii) when remedial and regulatory measures are selected;
- iii) when monitoring indicates that beneficial uses have been restored.

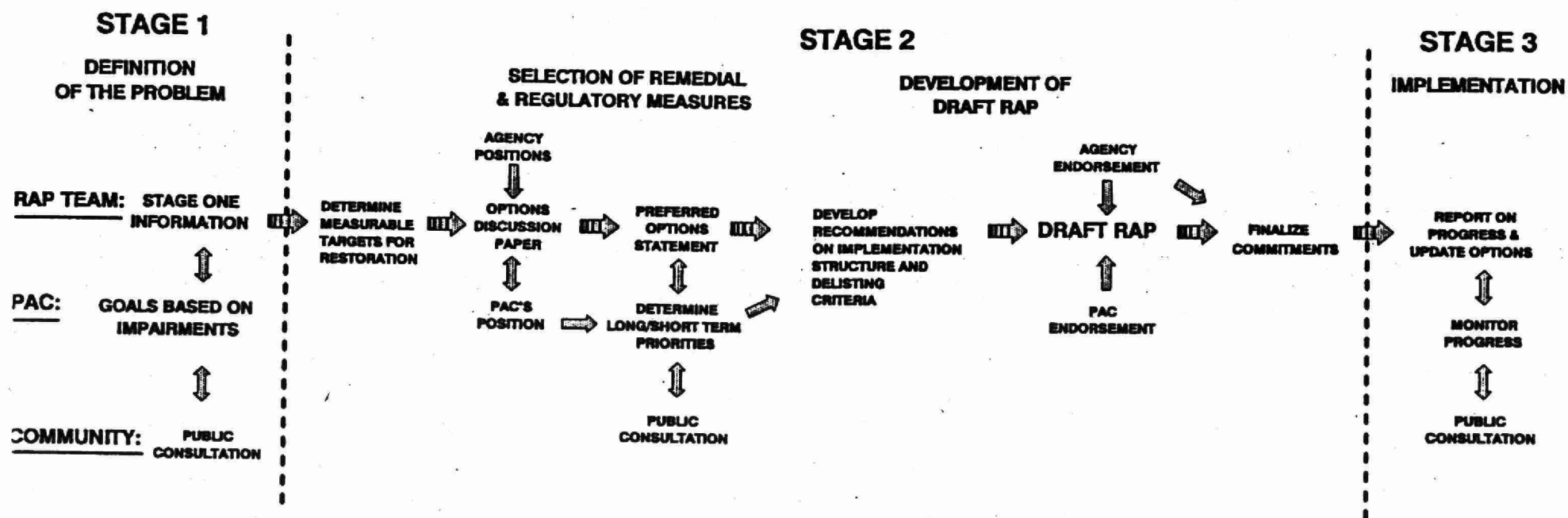
In practice, the three stages of RAP reporting translate into three stages of the RAP itself, which can be broadly described as "Problem Definition," "Selection and Implementation of Remedial Measures" and "Restoration of Beneficial Uses." The Problem Definition stage is primarily concerned with the gathering and interpretation of information to determine the extent and sources of impaired uses in the Area of Concern. Based on the findings of impairments, wide-ranging consultation with the PAC is undertaken to determine goals for beneficial uses and to aid in the preparation of a Problem Definition document, to be submitted to the Canada/Ontario Agreement board of review and the IJC. In the second RAP stage, Selection and Implementation of Remedial Measures, options for remedial action are developed by the RAP Team and drafted into a Discussion Paper, which is then submitted to the PAC and reviewed in a series of public meetings. After public response has been taken into account, the RAP Team works with the PAC towards selecting preferred options and negotiating implementation agreements. A Stage 2 report constitutes the recommended remedial action plan which is submitted by the RAP Team and PAC to the governments of Ontario and Canada, and in turn by the governments to the IJC for review and comment. The next stage, Restoration of Beneficial Uses, requires the monitoring of the remedial actions implemented, as well as a continuation of the public consultation process, to determine the effectiveness of remedial measures (Figure 1.1).

While the three stages of the RAP may be easily defined, in practice the process is much more complex. What has become clear at Collingwood Harbour and other Areas of Concern is that the RAP process is an ongoing one. This is in part due to the number of participants in the RAP--various levels of government, industry, environmental organizations and the general public--each with different, sometimes conflicting, concerns and priorities. Given that kind of complexity, fixed timetables and plans are difficult to maintain. But the continuing and evolving nature of the RAP is also due in part to the demands of environmental management itself. Ecosystems are by nature in a state of change, and new problems and opportunities may arise even within a short span of years. As well, advances in environmental technology and monitoring techniques may often require a change in the RAP's approach to solving problems. As a result, some remedial actions are implemented before Stage 2 of the RAP process is officially complete, while on the other hand further studies may be needed for other actions to be implemented or to take effect. The RAP process's wide-ranging mandate and its co-ordination of many interests, therefore, constitutes one of its greatest



strengths: the ability to adapt to the changing issues of water quality in the Great Lakes, while keeping its central goal of water-quality improvement and protection clearly in focus.

Figure 1.1 Schematic representation of the RAP process



## 1.5 RAP ACTIVITIES

Since its inception, the Collingwood Harbour RAP Team has been working steadily towards the development of a Remedial Action Plan for the harbour. After the creation of the Public Advisory Committee and a period of consultation with the RAP Team, the PAC approved a list of goals and uses for the harbour (see Section 1.6). In March of 1989, the RAP Team released its *Stage 1 Report: Environmental Conditions and Problem Definition*, which incorporated available environmental research data into a comprehensive description of water-quality problems in the harbour. The Stage 1 report was followed up by three complementary documents: *Supplementary Information on Environmental Conditions*, released in November, 1989, *Sediment Bioassays and Sediment Core Chemistry, Collingwood Harbour, 1988-1989*, released in June, 1990, and *Collingwood Harbour Mussel Biomonitoring*, released in October 1991.

On the basis of use goals approved by the PAC and the available information regarding environmental conditions and problem definition, the RAP Team began to generate options for remedial action in Collingwood Harbour in consultation with the PAC. The resulting list of 29 options, 16 of them technical and the remainder non-technical, was compiled into a preliminary Stage 2 document, *Making Choices: A Discussion Paper on Remedial Options*. In that document, the scope, objectives, advantages, disadvantages and estimated costs of each remedial option were presented in detail for public review. *Making Choices* was released to the PAC and the general community in March, 1991, and was followed by public consultation about remedial actions through stakeholders' meetings, a public workshop, media releases, newsletters and a televised presentation to Collingwood Town Council. Throughout this process, the public has been provided with the opportunity to respond to options for remedial action. The results of the public-response period were co-ordinated into workshop proceedings prepared by the PAC with the assistance of the RAP Team. That paper, along with comments gathered from public meetings, formed the basis for the RAP Team's selection of remedial actions for Collingwood Harbour.

In addition to the preparation of a Problem Definition document and a discussion paper on remedial options, the RAP Team has been active in promoting its activities through attendance at community events and the publication of fact sheets and newsletters. In helping to inform the public about the RAP process, the Public Awareness Subcommittee of the PAC has played a central role. Indeed, with the aid of the Public Awareness Subcommittee, several remedial actions, dealing with public education on ways to improve the harbour's water quality, have already been initiated (see Sections 3.2 and 3.3).

The RAP Team continues the process of monitoring water quality in the harbour. Sediment surveys are now scheduled to be conducted every five years. For this year and next, and every five years afterwards, limnological studies into water quality will be undertaken. According to the same time frame, analyses of spottail shiners will be performed to monitor the presence of contaminants in fish, and fish and wildlife surveys will track the implementation of actions to restore fish and wildlife habitat. As well, extensive bacteriological testing will continue to be undertaken during storm or high-flow periods.

**Table 1.4**  
**SUMMARY OF COLLINGWOOD HARBOUR RAP ACTIVITIES**

|                           |  |
|---------------------------|--|
| <b>1986</b>               | Designation of Collingwood Harbour as an Area of Concern<br>Formation of federal/provincial Collingwood Harbour RAP Team   |
| <b>November 1988</b>      | Formation of Public Advisory Committee   |
| <b>January 1989</b>       | Approval by PAC of goals and uses for Collingwood Harbour  |
| <b>March 1989</b>         | Release of <i>Stage 1: Environmental Conditions and Problem Definition</i>   |
| <b>Spring 1990</b>        | Formation of Public Awareness Subcommittee of PAC  |
| <b>March 1991</b>         | Release of <i>Making Choices: A Discussion Paper on Remedial Options</i>   |
| <b>May 1991</b>           | <i>Socioeconomic Profile of the Town of Collingwood</i> , prepared for RAP by Keir Consultants Inc.                        |
| <b>Spring/Summer 1991</b> | Stakeholders' meetings, formal public meetings to discuss remedial options<br>Preparation of PAC position paper on options |
| <b>Spring 1991</b>        | <i>Collingwood Harbour RAP Phosphorus Budget Model</i> , prepared by Gore & Storrie Ltd. (consultants)                     |
| <b>Fall/ Winter 1991</b>  | Preparation of Stage 2 report, including preferred options for remedial action   |

Along with co-ordinating efforts to monitor water-quality conditions, the RAP has initiated research projects that are related to remedial actions for Collingwood Harbour. A socioeconomic profile of the Town of Collingwood was commissioned by the RAP Team in 1991 to illustrate the potential impacts of proposed remedial actions on the community. In 1990, the RAP commissioned a hydrodynamic model of the harbour, which detailed the probable effects of several remedial options concerning the sewage treatment plant and modification of the flow of water in the harbour; the results of the phosphorus budget model were received by the RAP Team in May 1991. In the winter of 1990, the municipality, in conjunction with the RAP Team, engaged a consulting firm to conduct a computerized process audit of the sewage treatment plant to determine its current treatment capacity and the need, extent and cost of future upgrades to the plant, should they prove necessary. (See Section 3.1 - 2).

After a lengthy process of public review and input from the PAC, and taking into account the result of the most current research data available, the RAP Team has reached a consensus with the PAC and recommends the preferred remedial measures for Collingwood Harbour presented in this document. A complete discussion of those options is presented in Section 3.

## 1.6 GOALS AND BENEFICIAL USES FOR COLLINGWOOD HARBOUR

After consultation with the RAP Team about environmental conditions and water-quality problems in the harbour, the Public Advisory Committee approved a list of goals and beneficial uses to be maintained or achieved by the Remedial Action Plan. The PAC recognized that Collingwood Harbour has been and will continue to be a site for a blend of industrial and recreational uses. In keeping with that recognition, the PAC decided upon the following goals and uses, which met with public approval in January, 1989.

### GOALS

- 1. Water quality in the harbour should be such that the flow into Nottawasaga Bay should not adversely change the bay or affect the town's drinking water.*
- 2. The harbour water should be aesthetically pleasing so it can be used for passive recreation.*
- 3. Use of the harbour should ensure that fish and wildlife levels within the harbour are sustained.*
- 4. Designated swimming areas should not be a goal within the harbour, but water quality should meet provincial bacteriological guidelines for body-contact recreation with the exception of limited periods following storms.*

In light of the impaired uses for Collingwood Harbour under Annex 2 of the GLWQA, the goals agreed upon by the PAC are attainable through redressing the problem of eutrophication in the harbour and reducing nuisance algal growth, as well as maintaining bacterial levels at or below those recommended for body-contact recreation. Fish and wildlife populations are, at present, healthy, although there are restrictions on consumption of large yellow perch; contaminant levels in restricted perch, however, have not been attributed to sources of mercury within the harbour. As well, restrictions on open-water sediment disposal could hamper navigational dredging.



The following beneficial uses, grouped into commercial/industrial and recreational uses, were agreed upon by the PAC:

## **USES**

### *Commercial/Industrial*

1. *Continued disposal of sewage treatment plant effluent.*
2. *Maintain existing shipping, berthage and grain handling.*
3. *Charters.*
4. *Sightseeing.*
5. *Normal marine traffic and business at grain terminal.*

### *Recreational*

1. *Boating.*
2. *Sport fishing and ice fishing.*
3. *Nature observation.*
4. *Public marina (full service).*

Under Annex 2 of the GLWQA, restrictions on dredging constitute one of the impaired beneficial uses at Collingwood Harbour. Sediment contaminants are in excess of guidelines for open-water disposal of dredged sediment and the new provincial guidelines for Lowest-Effect Level. To maintain the uses of shipping and marine traffic at the harbour's grain terminal, however, periodic dredging will be necessary. As a result, the reduction of contaminants in the harbour sediment to levels that are acceptable for open-water disposal would facilitate future shipping activities. The success of charter and sightseeing operations in the harbour would be affected by the occurrence of eutrophication and enhanced by the maintenance of fish and wildlife populations in the harbour. Eutrophication may also impair the recreational uses agreed upon by the PAC; in particular, boating and nature observation may be affected by nuisance algal growth. Sport and ice fishing are subject only to restrictions on the consumption of large perch. As well, use of the harbour as a site for nature observation depends on the continued maintenance and promotion of wildlife habitat in the harbour's environs.



## 1.7 CRITERIA FOR EVALUATING REMEDIAL OPTIONS

In April, 1990, the Public Advisory Committee met with the RAP Team to discuss criteria for evaluating remedial options for Collingwood Harbour. These criteria, developed before remedial options were decided upon in order to supply a matrix for discussion, formed the basis for the public review of options that took place in March, 1991, and for the selection of the preferred remedial actions in this document.

### Criteria

- *Does the proposed remedial measure meet the community's agreed-upon uses and goals for the harbour?*
- *Is it cost effective?*
- *Is it practical?*
- *How will it affect landowners?*
- *Is it acceptable to the public?*
- *Is it a permanent solution?*
- *Is it easy (realistic) to continue or maintain?*
- *Does it allow the harbour to be delisted as an Area of Concern?*
- *Will it achieve the results in an acceptable time period?*
- *Is responsibility for the remedial measure shared?*
- *What is its impact on existing and proposed land uses?*
- *Does it temporarily affect the use of the harbour when it is implemented?*

## **1.8 PROPOSED DELISTING CRITERIA FOR COLLINGWOOD HARBOUR**

In September and October, 1991, the RAP Team and the PAC's Technical Subcommittee developed delisting criteria for Collingwood Harbour. The purpose of the criteria is to determine measurable targets for restoration of impaired uses for Areas of Concern as identified in Annex 2 of the GLWQA. As such, the criteria are comprehensive, applying to Collingwood Harbour as an Area of Concern, and do not necessarily imply that all impaired uses require remedial action to be restored. In other words, some of the targets listed have already been achieved or were already in effect at the time of the harbour's listing as an Area of Concern. For those that have already been achieved, the task for the RAP is the maintenance of the target conditions. The targets that have not yet been achieved are addressed by the remedial actions proposed in this report.

In each case, the targets described for each use impairment described in the following pages correspond to quantifiable conditions that will restore the particular beneficial use. A rationale follows each target description, and places the restoration target in the context of IJC delisting guidelines and the Public Advisory Committee's Use Goals for the harbour.

Until support from individual provincial and federal agencies on the delisting criteria can be confirmed, these targets constitute a proposal, pending their adoption at a corporate policy level in the agencies.

## **MEASURABLE TARGETS FOR THE RESTORATION OF BENEFICIAL USES FOR THE DELISTING OF COLLINGWOOD HARBOUR**

| <b>USE<br/>IMPAIRMENT</b>                        | <b>RESTORATION TARGET<br/>FOR DELISTING</b>  | <b>Status</b>  |
|--|--|--|
| i) Restrictions on fish and wildlife consumption | <ul style="list-style-type: none"> <li>• Absence of restrictions on fish and wildlife consumption in the harbour due to sources from the Area of Concern</li> <li>• Presence of restrictions on fish and wildlife consumption but not attributable to harbour sources</li> </ul> | <ul style="list-style-type: none"> <li>• Achieved (section 2.2-3)</li> <li>• Achieved</li> </ul>   |
| ii) Tainting of fish and wildlife flavour        | <ul style="list-style-type: none"> <li>• There are no complaints about fish tainting.</li> <li>• The incidence of tainting contaminants (such as phenols) in the water column do not exceed the water-quality objective</li> </ul>   | <ul style="list-style-type: none"> <li>• Achieved (no complaints registered with government agencies or anglers associations)</li> <li>• Achieved (phenols below detection)</li> </ul> |

### **Rationale**

#### **i) Restrictions on fish and wildlife consumption**

Absence of consumption advisories, or presence of advisories which are demonstrated not to be due to input from the Area of Concern, are in accordance with the IJC delisting guideline, meet PAC Use Goals for fishing, account for jurisdictional and federal standards, and emphasize local watershed sources.

#### **ii) Tainting of fish and wildlife flavour**

The absence of reports of fish tainting and compliance with relevant water-quality standards, objectives or guidelines are in accordance with the IJC delisting guidelines, and meet PAC Use Goals for fishing.

| USE<br>IMPAIRMENT                                 | RESTORATION TARGET FOR<br>DELISTING  | Status  |
|---|--|---|
| iii) Degradation of fish and wildlife populations | <ul style="list-style-type: none"> <li>• A fish community is maintained comparable to those observed in similar habitats outside the harbour and representative of a mesotrophic environment, containing pike, bass, yellow perch and walleye</li> <li>• Proposed fish community: Piscivores 45-60% /116-150 kg/ha; Benthivores 40-50%/103-130 kg/ha; Planktivores 1%; Herbivores &lt;0.5% (based on effects of improved water quality in the Bay of Quinte and the Hamilton Harbour Stage 2 RAP)</li> <li>• Preservation of provincially significant bird species including the great egret (<i>Casmerodius albus</i>), common tern (<i>Sterna hirundo</i>), Caspian tern (<i>Sterna caspi</i>), double-crested cormorant (<i>Phalacrocorax auritus</i>) and the black-crowned night heron (<i>Nycticorax nycticorax</i>). Since management of colonial water birds is experimental, achieving specific population densities would be speculative</li> <li>• Other wildlife, including waterfowl: a target has been recommended that will enhance fish and wildlife habitat, but the urban nature of the harbour is recognized as a constraint to colonization</li> </ul> | <ul style="list-style-type: none"> <li>• Achieved (section 2.2-5; field survey 1992)</li> <li>• Field survey 1992</li> <li>• Achieved (section 2.2-5)</li> <li>• Option 11</li> </ul> |

## Rationale

### iii) Degradation of fish and wildlife populations

Healthy, self-sustaining populations of fish such as pike, bass, and yellow perch with the community dominated by piscivores and benthivores, indicates a mesotrophic environment. Populations of large predatory fish such as walleye are transitory in nature, due to the limited littoral zone and warm harbour water temperatures during summer months, so that population densities experience temporal variation and are dependent upon conditions in Georgian Bay. As well, sediment bioassays with fish confirm no significant toxicity, supplementing community structure data. Protection of resident species requires that habitat quality and quantity be sustained. Preservation of provincially significant bird species is in accordance with the IJC delisting guidelines and meets the PAC's ecosystem approach, Use Goals for fishing, recreation, nature observation and aesthetics. For species that are transitory, and their presence in the harbour is also dependent upon protection of habitat in adjacent and remote locations.

| USE IMPAIRMENT   | RESTORATION TARGET FOR DELISTING  | Status  |
|--|---|---|
| iv) Fish tumours and other deformities                 | <ul style="list-style-type: none"> <li>• Compliance with all existing and future provincial, federal and IJC biological tissue standards or objectives, or value no different from those in Georgian Bay and local sources not the cause</li> <li>• No reproductive deformities in sentinel species</li> </ul>  | <ul style="list-style-type: none"> <li>• Achieved (section 2.2-5)</li> <li>• Included in monitoring and surveillance plans</li> </ul> |
| v) Bird or animal deformities or reproduction problems | <ul style="list-style-type: none"> <li>• Compliance with all existing and future provincial, federal and IJC biological tissue standards or objectives or value no different from those in Georgian Bay and local sources not the cause</li> <li>• Establishment of bioavailable metal concentrations in harbour sediment that are not of toxicological significance</li> </ul> | <ul style="list-style-type: none"> <li>• Achieved (sections 2.2-3, 2.2-5)</li> <li>• Achieved (section 2.2-3)</li> </ul>              |

## Rationale

### iv) Fish tumours and other deformities

Compliance with tissue standards or objectives is proactive, and prevents the induction of tumours and deformities in fish and fish consumers. This meets the IJC delisting guideline that incidence rates of fish tumours and other deformities do not exceed rates at control sites, and is consistent with the PAC's ecosystem approach and meets its Use Goals for fishing and nature observation. Biomonitoring of reproductive impairments with sentinel species will provide complementary biological data. Due to limited area and fish biomass, monitoring for tumours in fish such as brown bullheads not feasible (I. Smith, OMOE, pers. comm. 1992).

### v) Bird or animal deformities or reproduction problems

Compliance with tissue standards or objectives is proactive, and prevents the induction of tumours and deformities in fish and fish consumers. This meets the IJC delisting guideline that incidence rates of reproductive problems and deformities do not exceed rates at control sites, is consistent with the Public Advisory Committee's ecosystem approach and meets the PAC Use Goals for

passive recreation and nature observation. Without sufficient evidence to suggest that deformities or reproductive impairment is probable, an extensive biomonitoring program is not warranted.



| USE IMPAIRMENT                           | RESTORATION TARGET FOR DELISTING   | Status   |
|--|--|--|
| vi) Degradation of benthos               | <ul style="list-style-type: none"> <li>● Due to frequent disruption of benthic communities as a consequence of shipping, the emphasis is placed on demonstrating the absence of acute and chronic toxic effects of sediment-associated contaminants, and on demonstrating bioassay end points comparable to controls</li> <li>● Benthic community structure outside the turning basin is not significantly different from control sites of comparable physical and chemical characteristics (shallow, silty sand substrates with no oxygen limitation)</li> <li>● Benthic biomass outside the turning basin is typical of mesotrophic conditions, ranging from 25 to 50 g•m<sup>-1</sup> wet weight of benthos</li> <li>● Populations of mesotrophic species such as the mayfly (<i>Hexagenia</i>), the fingernail clam (<i>Pisidium</i>) and the oligochaetes <i>Lyodrilus templetoni</i> and <i>Spirosperma ferox</i> are present where suitable substrates are located</li> </ul> | <ul style="list-style-type: none"> <li>● Achieved (section 2.2-3)</li> <li>● Achieved (section 2.2-3)</li> <li>● Achieved (section 2.2-3)</li> <li>● Achieved (section 2.2-3)</li> </ul> |
| vii) Restrictions on dredging activities | <ul style="list-style-type: none"> <li>● Concentrations of metals, trace organic compounds and nutrients in sediment within harbour do not exceed the provincial sediment guidelines for Lowest Effect Level, except where background concentrations exceed this level</li> </ul>  | <ul style="list-style-type: none"> <li>● Implement Option 14</li> </ul>  |

## Rationale

### vi) Degradation of benthos

Benthic community structure and biomass resemble control sites of comparable physical and chemical characteristics, and sediment bioassays confirm no toxicity, in accordance with IJC delisting guideline and requirements for healthy, self-sustaining fish and wildlife communities.

### vii) Restrictions on dredging activities

Concentrations of contaminants in sediment meet standards, criteria or guidelines, except where background concentrations exceed these values. This is in accordance with IJC delisting guidelines and PAC Use Goals for navigation, grain handling and berthage.

| USE IMPAIRMENT  | RESTORATION TARGET FOR DELISTING  | Status   |
|---|---|--|
| viii) Eutrophication or undesirable algae                                   | <ul style="list-style-type: none"> <li>● All harbour waters have persistent<sup>1</sup> phosphorus concentration of <math>&lt;20 \mu\text{g L}^{-1}</math>, a Secchi disc transparency of <math>&gt;1.2 \text{ m}</math>, dissolved oxygen at saturation, and chlorophyll concentration of <math>&lt;10 \mu\text{g L}^{-1}</math>, unionized <math>\text{NH}_3</math> <math>&lt;0.02 \text{ mg L}^{-1}</math>, P load from STP <math>&lt;2760 \text{ kg/year}</math></li> </ul>   | <ul style="list-style-type: none"> <li>● Implement Options 5, 27, 7 and/or 6</li> </ul>                  |
| ix) Restrictions on drinking water consumption, or taste and odour problems | <ul style="list-style-type: none"> <li>● Maintain water-quality conditions in the harbour so as not to adversely affect water quality in Nottawasaga Bay in the vicinity of the Water Treatment Plant Intake (there are no water intakes within the harbour)</li> <li>● No restrictions or noncompliance with provincial drinking water objectives in treated drinking water which are attributable to sources within the Area of Concern and no reported taste or odour problems attributable to sources within the Area of Concern</li> </ul> | <ul style="list-style-type: none"> <li>● Achieved</li> <li>● Achieved (sections 2.2-1, 2.2-2)</li> </ul> |

## Rationale

### viii) Eutrophication or undesirable algae

Ensuring that a persistent phosphorus concentration of less than 20 g/L, oxygen saturation and specified Secchi disc transparencies, chlorophyll concentrations and unionized ammonia concentrations and maximum phosphorus loading to the harbour are not exceeded is in accordance with IJC delisting guideline that there be no persistent water-quality problems attributed to cultural eutrophication. This also meets the PAC Use Goals for boating, passive recreation, nature observation, sightseeing, fishing and aesthetics.

### ix) Restrictions on drinking water consumption or taste and odour problems

Preventing harbour waters from having an impact on the water intake in Nottawasaga Bay meets the IJC delisting guideline and the PAC's ecosystem approach, while fulfilling the PAC Use Goal that harbour water not adversely affect the bay.

<sup>1</sup> "Persistent" is defined in terms of impairing beneficial uses and is of particular relevance during the open-water season from April to November. Therefore, the targets identified will be met on the basis of monthly average concentrations for the harbour.

| USE IMPAIRMENT                              | RESTORATION TARGET FOR DELISTING  | Status   |
|---|---|--|
| x) Beach closings                           | <ul style="list-style-type: none"> <li>● Body contact recreation is not encouraged in the harbour due to boat traffic and the absence of beaches; however, waters used for body contact recreation should not exceed bacteriological standards, objectives or guidelines for such use, with the exception of storm events</li> <li>● Fecal coliforms do not exceed 100 counts• 100 mL<sup>-1</sup>, with the exception of storms</li> </ul> | <ul style="list-style-type: none"> <li>● Achieved (section 2.2-2)</li> <li>● Achieved (section 2.2-2)</li> </ul> |
| xi) Degradation of aesthetics               | <ul style="list-style-type: none"> <li>● Goals for criteria viii are met</li> <li>● Sightings of spills, oil slicks and flotsam, or reports of objectionable odours are at a frequency deemed aesthetically acceptable by the public due to improved spills-response programs</li> </ul>  | <ul style="list-style-type: none"> <li>● Options 5, 27, 7, 6 and 13 being implemented</li> </ul>                 |
| xii) Added costs to agriculture or industry | <ul style="list-style-type: none"> <li>● Not applicable; no industrial or agricultural withdrawals from harbour</li> </ul>  | <ul style="list-style-type: none"> <li>● Achieved (N/A)</li> </ul>   |

## Rationale

### x) Beach closings

Ensuring that waters used for body contact recreation do not exceed bacteriological standards, objectives or guidelines for such use, with the exception of 24 hours following a major storm event, is in accordance with the IJC delisting guidelines and the PAC Use Goals for bacteriological requirements.

### xi) Degradation of aesthetics

Goals for eutrophication are met, and sightings of oil slicks, surface scum and other substances that produce persistent or objectionable deposits are reduced to a frequency acceptable to the public. This is in accordance with the IJC delisting guidelines and with the PAC Use Goals for aesthetics, nature observation, sightseeing and passive recreations.

### xii) Added costs to agriculture and industry

Not applicable, because agriculture and industry make no water withdrawals from the harbour.

| USE IMPAIRMENT   | RESTORATION TARGET FOR DELISTING   | Status   |
|--|--|--|
| xiii) Degradation of phytoplankton and zooplankton populations | <ul style="list-style-type: none"> <li>• Healthy fish communities are present in the harbour, indicating a viable plankton community</li> <li>• Algal bioassays show no significant differences in toxicity between harbour and control samples</li> </ul>   | <ul style="list-style-type: none"> <li>• Achieved (section 2.2-5)</li> <li>• Achieved (section 2.2-1)</li> </ul>   |
| xiv) Loss of fish and wildlife habitat                         | <ul style="list-style-type: none"> <li>• A minimum of 500 m<sup>2</sup> additional littoral shore is provided in conjunction with future harbour development, where possible, and through the removal of Purple Loosestrife</li> <li>• Existing waterfront shorelines are modified to provide cover for fish and wildlife</li> <li>• Official Town Plan is amended to include due consideration of habitat restoration for future development</li> <li>• The Collingwood Wetland Complex (96.4 hectares), within and adjacent to the harbour and assessed as a provincially significant Class 2 Wetland, is protected to the maximum extent possible under the Planning Act and in conjunction with current provincial and federal programs in addition to municipal incentives</li> </ul> | <ul style="list-style-type: none"> <li>• Option 10 &amp; 11</li> <li>• Option 11</li> <li>• Option 10 (achieved)</li> <li>• Option 10 (ongoing)</li> </ul> |

## Rationale

### xiii) Degradation of phytoplankton and zooplankton populations

Demonstration of healthy fish community is used to indicate viable plankton community. This incorporates the ecosystem approach. Bioassay data confirm no significant toxicity in ambient waters, in accordance with IJC delisting guideline and PAC Use Goals for recreation.

### xiv) Loss of fish and wildlife habitat

Additional littoral shoreline is provided in conjunction with future harbour development, and the existing 96.4 hectares of the Collingwood Wetland Complex is protected. The limited amount of littoral zone in Collingwood Harbour is recognized, particularly in the eastern portion, where habitat rehabilitation is most appropriate. Depth increases rapidly in this region, restricting the littoral zone. However, this area of the harbour is most amenable to habitat creation due to the existing waterfront shorelines, which are currently not suitable habitat. While the existing wetland provides a niche for resident flora and fauna, the Purple Loosestrife infestation is eliminating habitat. The control program will rehabilitate the wetland. It should also be noted that the wetland complex extends outside the harbour and provides habitat for transient fish and wildlife in the vicinity of the harbour. Rehabilitation and protection is in accord-

ance with IJC guidelines requiring that fish and wildlife management goals have been achieved, and with PAC Use Goals for fishing, nature observation, passive recreation and aesthetics. The location of habitat creation will be based on compatibility with other Use Goals, such as shipping and boating.

## **1.9 RAP MONITORING PROGRAMS**

In addition to the environmental studies that have been conducted since the inception of the Collingwood Harbour RAP, the RAP Team has proposed an extensive monitoring program to provide information on water quality in the harbour. The program is designed to monitor the major water-quality issues affecting the harbour, including sediment contamination, fish and wildlife populations, habitat restoration and bacteriological testing. Commitments of funding and staff will be required from several agencies in order to institute the monitoring program necessary to evaluate the success of remedial actions in restoring the harbour ecosystem.

Among the program's major components:

- 1) Sediment surveys, to be conducted every five years, commencing in 1991. These surveys include mapping of potential contaminants in sediment, benthic community structure, and sediment bioassessment.
- 2) Limnological water-quality studies, including STP effluent monitoring, to be conducted in 1992, 1993, and 1994, in conjunction with the implementation of the primary remedial actions. Monitoring will then decrease and once every five years thereafter, until consistent water-quality restoration has been demonstrated.
- 3) Analysis of spottail shiner populations to monitor the presence of contaminants in fish, to be conducted in 1993, and once every three to five years, until consistently low tissue residues are established. Fish embryo deformities to be monitored in 1993 and 1994, and the duration of the program to be determined based on the results of these surveys.
- 4) Contaminants in sport fish to be measured in 1993 and 1995, until the absence of fish consumption advisories are verified, or consistently low tissue residues are established.
- 5) Fish and wildlife surveys, including habitat mapping and evaluation, to monitor the effectiveness of fish and wildlife habitat rehabilitation in the harbour and Black Ash Creek. Baseline conditions to be established in 1992, with surveys repeated in 1995 and the need for further work determined at that time.
- 6) Extensive bacteriological testing, to be conducted during storm events and high-flow periods in 1992 and 1993, until definitive events are captured and information the absence of elevated bacteria concentrations is verified.



**II. COLLINGWOOD HARBOUR**  
**PROBLEM DEFINITION**

## II. COLLINGWOOD HARBOUR

### 2.1 PHYSICAL DESCRIPTION

**Watershed:** Collingwood Harbour is situated on the south shore of Nottawasaga Bay, which constitutes the southern extension of Lake Huron's Georgian Bay. Two physiographic regions, the Niagara Escarpment on the upper part of the basin and the Simcoe Lowlands in the lower, make up the harbour's watershed. Osler Bluffs form the upper reach of the escarpment, with their highest point some 360 metres (1200 feet) above the harbour. The lowlands region ends with a sand plain of beaches along the shore of Nottawasaga Bay. Three tributaries drain into Collingwood Harbour. Oak Street Canal and Hickory Street Canal, both of which have their mouths at the south shore of the harbour, flow only intermittently and receive drainage from municipal storm sewers. Black Ash Creek, the largest of the tributaries, empties into the southeast corner of the harbour; it drains the agricultural area surrounding the Town of Collingwood and is complemented by in-stream and bypass ponds that have been constructed for recreation.

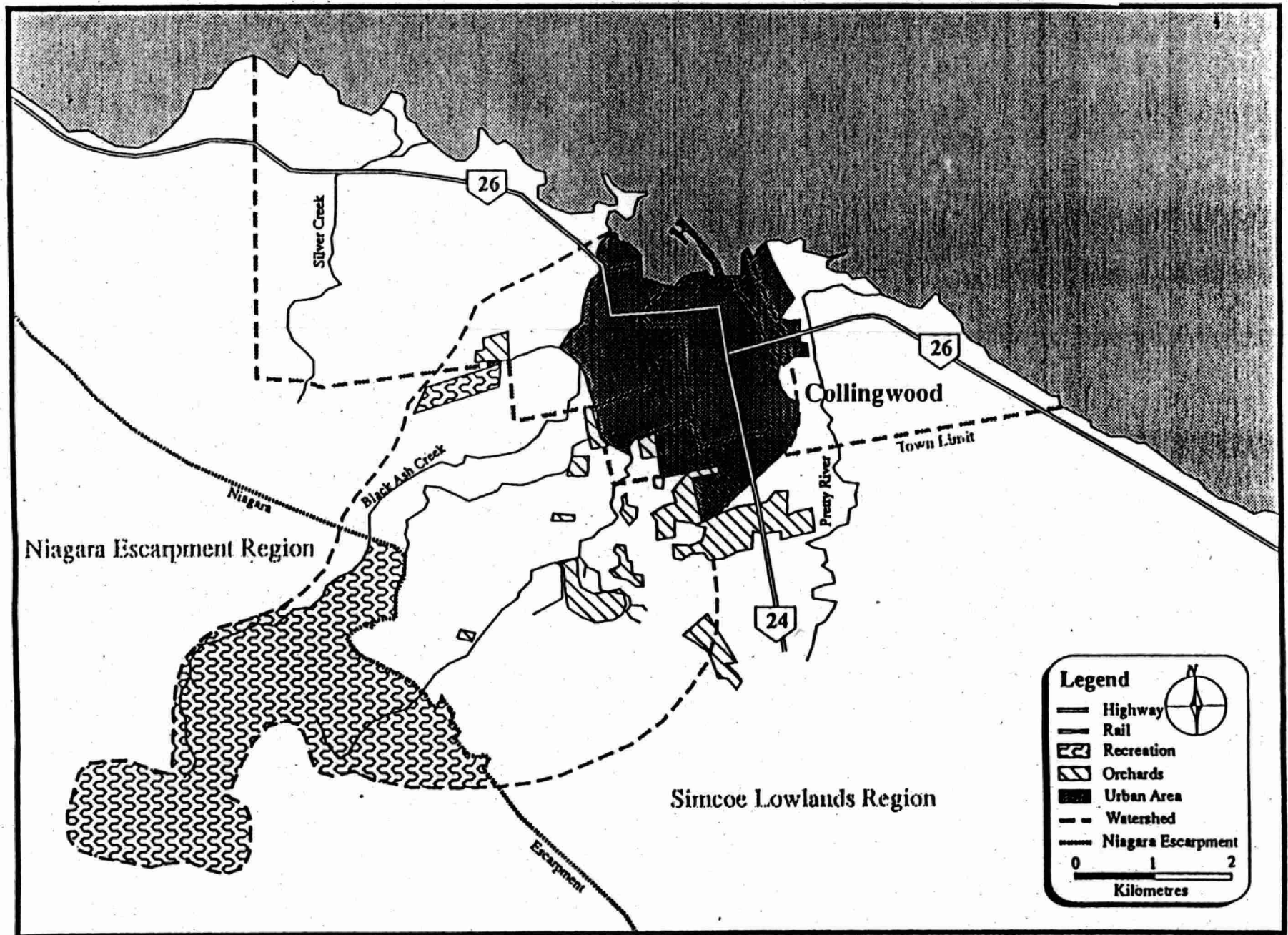
**Harbour Dimensions:** At the harbour's mouth, a breakwater pier extends east from the western shore for .22 km (240 yards); another pier, extending northwest from the southern shore for 1.02 km (.63 miles), defines the eastern arm of the harbour. The entrance gap to the harbour between these two piers is 420 m (460 yards) wide. The harbour itself occupies an area of 0.8 km<sup>2</sup> and is relatively shallow by Great Lakes standards, with a maximum depth in 1989 of 6.4 m (21 feet). Its volume has been estimated at  $28.7 \times 10^{-4}$  km<sup>3</sup>. Prevailing winds enter the harbour, as do waves from the lake coming from the north and northeast. The harbour's position at the south end of Nottawasaga Bay and the fact that there is only one opening into the bay limit exchange between the harbour and surrounding waters—a factor that affects the diffusion of discharge from the municipal sewage treatment plant, which is located on the south shore of the harbour, as well as the rate of resuspension of sediment solids. Also, the harbour is subject to occasional oscillations in water level that occur from one end of Georgian Bay to the other (the seiche effect).

**Land Uses:** The harbour is surrounded by the Town of Collingwood (Figure 2.1), which in 1988 had a permanent resident population of 12,200. In the immediate vicinity of the harbour, the character of land use has shifted over the past decade from industrial to recreational and residential. On the harbour's eastern pier is the Collingwood Terminals elevator, the most directly noticeable manmade feature of the harbour; the elevator is still in operation, but Collingwood Terminals has no plans to expand the facility. An access road along the eastern pier, owned by CN Rail, is still used for transportation to and from the terminal, but the pier's rail line sits unused. To the north of the elevator, near the harbour's mouth, is a confined disposal facility; to the south of the elevator is the Collingwood Yacht Club. Property in the southeastern corner of the harbour, owned by Canada Shipbuilding and Engineering and formerly operated as a launch basin and dry dock area, also remains unused at present. The

municipal sewage treatment plant occupies the lands immediately west of the Canada Shipbuilding property and empties its treated effluent directly into the harbour. Harbourview Park, a municipally owned area, comprises 18 hectares (44.5 acres) of land along the southwestern shore. On the western shore are two marinas, one operated by Kaufman condominiums at the site of an old Imperial Oil wharf, and the other, to the north of the Kaufman marina, operated by Cranberry Village. Residential properties on the harbour include Mariner's Haven Condominiums on the western shore, which comprise 32 duplex villas, and waterfront land owned by Cranberry Village, which includes some 500 condominiums and a wide range of recreational facilities located across the highway from the harbour.

**Wetlands:** Collingwood Harbour is home to significant wetland areas, incorporating three different types of habitat--fen, swamp and marsh--along the western and southwestern shores (Figure 2.2). In 1986, the Ontario Ministry of Natural Resources identified a 96 hectare (237 acre) area as the Collingwood Harbour Marsh Wetland, a provincially significant Class 2 wetland, with boundaries at the 2 m (6.5 foot) depth contour. The area provides cover for local wildlife as well as staging and protection for waterfowl, and is significant in fish spawning and rearing.

Figure 2.1  
Land Use and Drainage Basin of the Collingwood Area





## 2.2 PROBLEM DEFINITION

*This section deals with the environmental concerns in Collingwood Harbour that relate to the Goals for Beneficial Uses established by the Public Advisory Committee in January, 1989, and to the Beneficial Uses and listing criteria under Annex 2 of the Great Lakes Water Quality Agreement. The problems outlined below formed the basis for public consideration of remedial action as they were presented in Making Choices: A Discussion Paper on Remedial Options (March, 1991). Descriptions of the problem, its sources, current status and the uses it impairs are provided, as well as an indication of the proposed remedial actions (discussed in detail in Section 3).*



TABLE 2.1

**Use Impairments Recognized by Annex 2 of the GLWQA, and Their Significance to Collingwood Harbour as of 1992**

| POTENTIAL IMPAIRED USE   | CURRENT STATUS  | RELEVANCE TO COLLINGWOOD HARBOUR  |
|--|---|---|
| Restrictions on fish and wildlife consumption  | Impaired: not attributable to local sources             | Human consumption advisory on yellow perch larger than 35 cm; not attributed to local sources of mercury. No other restrictions.  |
| Tainting of fish and wildlife flavour  | Not Impaired  | No reports of tainting.   |
| Degradation of fish and wildlife populations. a) physiology/ reproduction b) community composition/abundance | a) Not Impaired<br>b) no historical data for comparison | Surveys indicate healthy populations of benthivores and piscivores. No historical data to confirm whether abundance/ composition is impaired                                  |
| Fish tumors or other deformities   | Not Impaired  | No reports of tumors or other deformities.  |
| Bird or animal deformities or reproductive problems  | Not Impaired  | Wetlands support healthy communities of provincially significant species.   |
| Degradation of benthos.  | Not Impaired  | Benthos typical of eutrophic and mesotrophic conditions. Resident fauna do not have elevated tissue concentrations of contaminants.   |
| Restrictions on dredging activities  | Impaired  | Concentrations of some contaminants are in excess of open water disposal guidelines in localized areas.   |
| Eutrophication or undesirable algae  | Impaired  | Phosphorus concentration periodically exceeds 20 ug/l; algae blooms have been reported. Algae may impair boating.   |
| Restrictions on drinking water consumption, taste and odour problems   | Not Impaired  | N/A. Water intake is outside the harbour. Harbour water quality does not effect water intake  |
| Beach closings   | Not Impaired  | Concentrations of fecal coliform below 100 counts per 100 mL  |
| Degradation of aesthetics  | Not Impaired  | Current level to be maintained or improved.   |
| Added costs to agriculture or industry   | Not Impaired  | N/A. No industrial or agricultural withdrawals from the harbour.  |
| Degradation of phytoplankton and zooplankton populations   | Not Impaired  | Fish community healthy, a good indication of viable plankton community. Phytoplankton bioassays show no growth inhibition   |
| Loss of fish and wildlife habitat  | Impaired  | No loss attributable to degraded sediment quality, some link to water quality possible. Historical loss reflective of extensive destruction of wetland throughout Great Lakes |

## 2.2 - 1 Nuisance Algal Growth

While instances of excessive algae have declined in recent years due to decreased nutrient loadings, nuisance algal growth continues to be a problem in Collingwood Harbour. The cause of occasional "algal blooms," during which excessive growth of algae occurs, usually in the warm summer months, is the eutrophic (nutrient-rich) condition of the harbour's water. In 1986, the Ontario Ministry of the Environment conducted a "caged" phytoplankton study to determine the relationship between algae and phosphorus concentrations in the harbour and to determine the qualitative effects of toxicants in the sewage treatment plant's discharge on algal growth and community structure. For four days in October, 1986, algae was sampled at three different stations within the harbour during a period of non-chlorination by the STP; a fourth open-water station was used as a control. As expected, with increased phosphorus concentration, algal samples at all three in-harbour stations indicated that phytoplankton biomass increased. The highest biomass occurred at the site closest to the STP outfall, where the concentration of phosphorus was also the highest. Those results suggested that the phosphorus in the harbour's waters is available for algal uptake and growth, and is largely responsible for the persistent problem of nuisance algal growth in the harbour. In the same study, algal growth indicated no toxicity-related inhibition (see Stage 1 report). The presence in the harbour of a healthy fish population also indicates that phytoplankton and zooplankton communities are viable.

The nutrient of concern in Collingwood Harbour is phosphorus. The Provincial Water Quality Objectives define a maximum phosphorus concentration of 0.020 mg/L as necessary for the prevention of nuisance algal growth. Surveys conducted by the Ontario Ministry of the Environment in 1980 and 1983 found that phosphorus levels ranged from an average of 0.153 mg/L at a site located between the sewage treatment plant and the shipyards (Aug. 30 to Sept. 1, 1983), to 0.011 mg/L at the harbour's mouth (Sept., 1980). In 1980, 1983 and 1986, overall phosphorus concentrations for the harbour exceeded Provincial Water Quality Objectives. In studies conducted in the open-water months of 1989 and 1990, however, average phosphorus levels throughout most of the harbour met or were below the provincial objective of 0.020 mg/L, and during the 1990 and 1991 study periods the concentration of phosphorus overall was well below the objective (Fig. 2.3). But in the same study periods, phosphorus concentrations were above 0.020 mg/L for periods of days or weeks in some of the more stagnant areas of the harbour,

### **Problem: Nuisance Algal Growth**

#### *Impaired Use under Annex 2:*

Eutrophication or undesirable algae, Degradation of aesthetics

*Relevant PAC Use Goals:* Sightseeing, Charters, Fishing, Boating, Nature observation, Safe Body Contact with Water

*Sources:* Sewage treatment plant, Black Ash Creek

*Status:* Improved in recent years, but problem continues

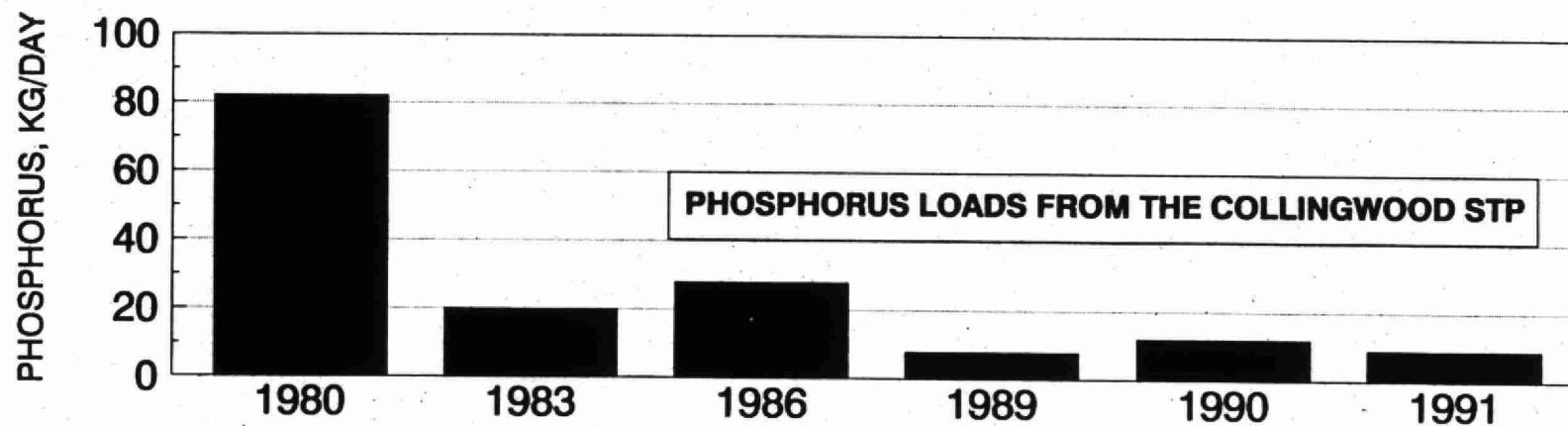
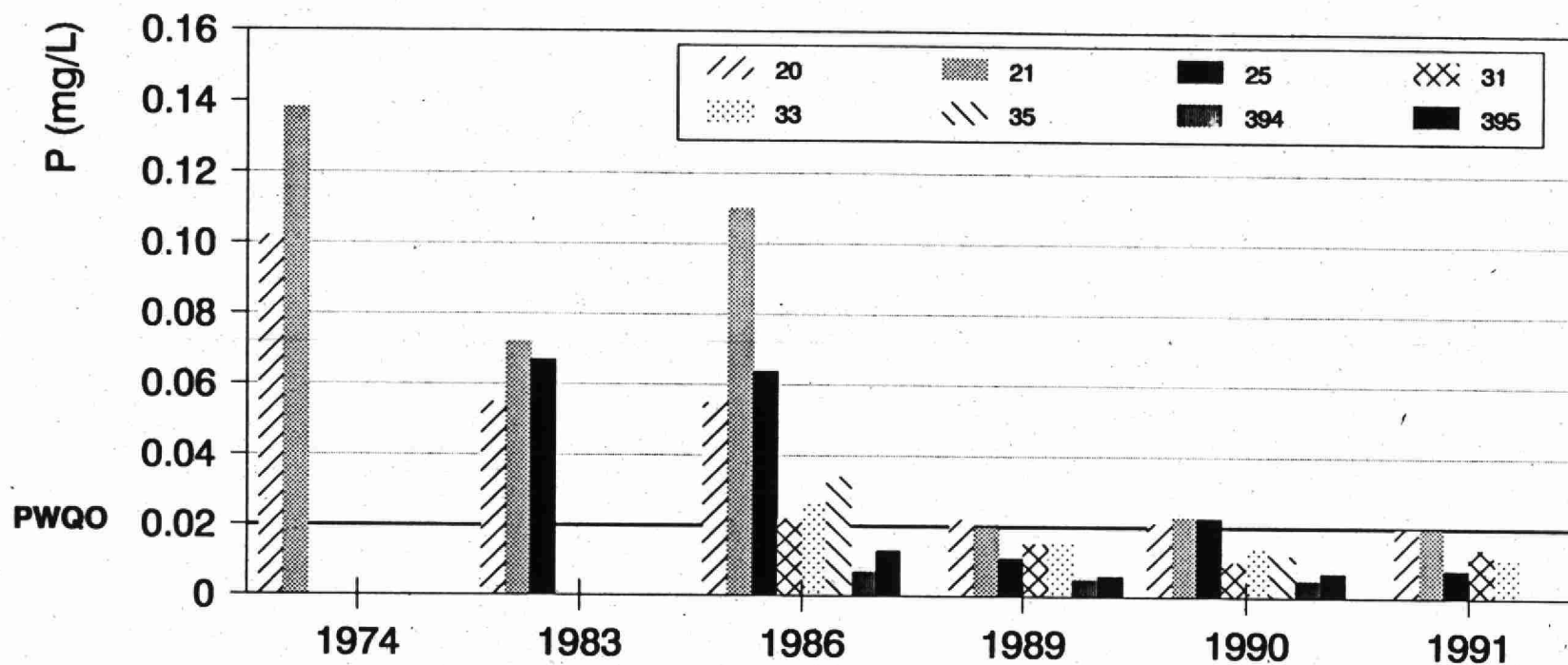
indicating that nuisance algal growth can still occur, if only within a limited area. Aside from the aesthetic nuisance of excessive plant growth, oxygen depletion is known to occur when algae begin to die and decompose. Bottom water of the harbour remain saturated with oxygen during routine sampling from 1989 to 1991, inclusive. Detailed transects performed by the students at Collingwood Collegiate Institute under the direction of the PAC representative from the education sector met with the same conclusions as those of the RAP Team.

**Impaired Uses:** The occurrence of nuisance algal growth corresponds to "Eutrophication or undesirable algae" under Annex 2 of the Great Lakes Water Quality Agreement. Nuisance algal growth also contributes to the degradation of aesthetics, another impaired use under Annex 2.

Nuisance algal growth does not impair the commercial uses for the harbour as determined by the Public Advisory Committee (as a receiving body for discharge from the sewage treatment plant, and as a site for shipping, berthage, charters and the continuation of normal marine traffic). Because it can detract from aesthetics in the harbour, however, nuisance algal growth may impair use of the harbour as a venue for sightseeing and the operation of charters. In addition, it can adversely affect the designated recreational uses for the harbour--fishing and boating in particular. Eutrophication could also impair fish habitat. Furthermore, while swimming is not encouraged in the harbour due to its current use as a site for marine traffic, one of the PAC's goals is that the harbour's waters should be safe for occasional body contact. But while excessive algae may impair visibility for safe swimming, swimming is not a Use Goal due to the hazards associated with boat traffic.

**Sources:** Excluding the extensive exchange of water that takes place between the northernmost region of the harbour and Nottawasaga Bay, the primary source of phosphorus to Collingwood Harbour is the municipal sewage treatment plant, located on the southern shore. It is estimated that the STP contributes as much as 96 per cent of total phosphorus loadings to the harbour. Due to uncertainty surrounding high-flow periods, a minimum of 92 per cent of the phosphorus load is attributable to the STP.

FIGURE 2.3  
**PHOSPHORUS CONCENTRATIONS IN COLLINGWOOD HARBOUR, 1974-1991**



**Table 2.2**  
**Current and Historical Industries In Collingwood with Waste Streams of Potential Relevance to Phosphorus Loading**

| Company                  | Product                      | Waste Stream of Interest  | Current Treatment                                       | Comments   |
|--------------------------|------------------------------|---|---|--|
| Canadian Mist Distillers | Canadian Mist Whiskey        | <ul style="list-style-type: none"> <li>• Corn mash high in BOD &amp; solids, veg. matter</li> <li>• Tanks cleaned with caustic solutions</li> </ul> | • Pre-treatment, then sanitary sewers                   | • Nutrient and hydraulic implications for loading to STP             |
| Nacan Products           | Food and industrial starches | <ul style="list-style-type: none"> <li>• Corn, veg. matter</li> <li>• Modifying chemicals used in process</li> </ul>                                | • Extended aeration pre-treatment, then sanitary sewers | • Nutrient and hydraulic implications for loadings to STP            |
| LOF Glass                | Automotive glass             | • Cleaning solutions  |   | • Switched from trisodium phosphate to phosphate-free cleaners, 1986 |

The growth of Collingwood's population and industry throughout much of this century contributed indirectly to water-quality problems because waste went to the STP. Until 1982, the municipal sewage treatment plant provided only primary treatment of waste water--simply removing floating or settleable solids from wastewater and discharging excessive levels of nutrients into the harbour waters--and therefore was responsible for high contributions of phosphorus. In 1980, for example, the STP loaded an average of just over 80 kg of phosphorus per day to the harbour. In 1983, the treatment facilities at the plant were upgraded to "secondary," and were then capable of decomposing the organic components of waste water. Since then, phosphorus loadings from the STP have diminished substantially, but by 1986 the plant's discharge still exceeded the Provincial Water Quality Objective of 1 mg/L. In the same year, operational changes were made at the plant and its sludge-handling capabilities were enhanced. As a result, STP discharge met water-quality objectives by 1987, and phosphorus loadings to the harbour from the STP continue to be substantially reduced from previous years (Figure 2.4). A plant process audit, commissioned by the municipality in co-ordination with the Collingwood Harbour RAP team, showed that the average phosphorus concentrations in STP effluent for 1989, 1990 and 1991 were 0.52, 0.68 , and 0.39 mg/L respectively (see Section 3.1-2).

Historically, waste water from local industries also added to phosphorus loadings to the STP. In recent years, local industry as a whole has altered its waste stream to decrease industrial loadings to the STP, resulting in the more efficient treatment of waste and lower overall phosphorus concentrations in STP discharge (Table 2.2).

A secondary source of phosphorus comprises the three small creeks that drain into the harbour, Black Ash Creek, Hickory Street Canal and Oak Street Canal. These may contribute phosphorus to the harbour as a result of drainage of phosphorus-containing fertilizers used in surrounding commercial, residential and agricultural lands. However, the loadings from the three creeks is relatively small. Although phosphorus



concentrations in Black Ash Creek are typically lower than those found in the two canals, the creek's overall contribution is higher because it flows regularly while the canals flow intermittently. It has been estimated that flows from Black Ash Creek are responsible for less than four per cent of total phosphorus loadings to the harbour, and that flows from Hickory Street Canal and Oak Street Canal account for less than one per cent each.

A third potential source of nutrients in the harbour is sediment. Surveys conducted in 1986 showed that much of the sediment phosphorus was in biologically available (non-apitate) form, suggesting that release of phosphorus from sediment could occur in cases of oxygen depletion in bottom waters. However, tests conducted by the RAP Team from April to November in 1989, 1990 and 1991 showed that the bottom depths of the harbour are nearly saturated with oxygen, indicating that phosphorus release from sediment is very improbable. Extensive nutrient modelling based on known sources of phosphorus to the harbour, and on the hydrodynamic characteristics of the basin, indicated that sediment was an insignificant source of phosphorus to harbour waters (Gore and Storrie, 1991).

**Status:** From 1986 to 1989, water quality in Collingwood Harbour generally improved, particularly as phosphorus loadings from the STP decreased. Since then, however, there has been little change in phosphorus loadings and, correspondingly, little improvement in overall water quality.

The harbour is likely to continue to be used municipally as a receiving body for discharge from the sewage treatment plant. As a secondary treatment facility, the existing STP is designed to handle loadings from a residential population of 20,000. By the year 2000, the population of Collingwood has been predicted to range from 12,500 (or no growth, by the most conservative projection formula) to almost 14,000 (by the least conservative formula). In either event, growth in the town's permanent population is likely to be relatively slow (Keir, 1991; see section 3.1-2). As a result, the current sewage treatment facilities are likely to remain adequate for servicing the residential community, especially if the optimization of STP processes and technologies are implemented as proposed in Section 3.2 of this plan.

Future use of the harbour is unlikely to include expanding industrial projects. The expected growth of commercial and residential facilities, however, as well as the recreational activities that go along with them (boating, fishing, swimming), is likely to have significant water-quality implications for the harbour. Commercial and residential expansion in the harbour area as proposed in the Town of Collingwood's *Master Planning Report* (see Section 3.1-2) will add to loadings to the STP, and incidental water pollution in the form of littering or grey water may occur with increased boating traffic. Degradation of water quality as a result of construction site run-off should be minimal if plans for harbourfront redevelopment are implemented according to agency requirements. Increased intensity of fishing and boating may also contribute to grey-water pollution, although phosphorus contributions from grey water are relatively small.



The elimination of nuisance algal growth and improvement of harbour aesthetics will also be directly related to the continuation of these activities.

### **Recommended Remedial Actions:**

#### Option 5 Optimize Operations at the Existing STP

*Relevant benefits:* Optimizing human and mechanical operations at the municipal sewage treatment plant will reduce phosphorus concentrations in STP discharge to  $0.3 \text{ mg} \cdot \text{L}^{-1}$  consistently; will reduce the chances of plant upsets; will assist in meeting provincial guidelines; will assist in meeting the STP P loading limit of 2760 kg/year.

#### Option 27 Water Conservation

*Relevant benefits:* A program of water conservation will allow for population growth in the town while maintaining existing STP; may reduce total loading of phosphorus to harbour; will reduce the cost of water treatment; will assist in meeting the STP P loading limit of 2760 kg/year.

#### Option 7 Extend the STP Outfall with a Diffuser into the Harbour

*Relevant benefits:* Extending outfall with diffuser will enhance dilution of phosphorus, resulting in overall concentrations in harbour that meet or are below provincial objectives for prevention of nuisance algal growth; make the outfall conform more closely to current provincial guidelines.

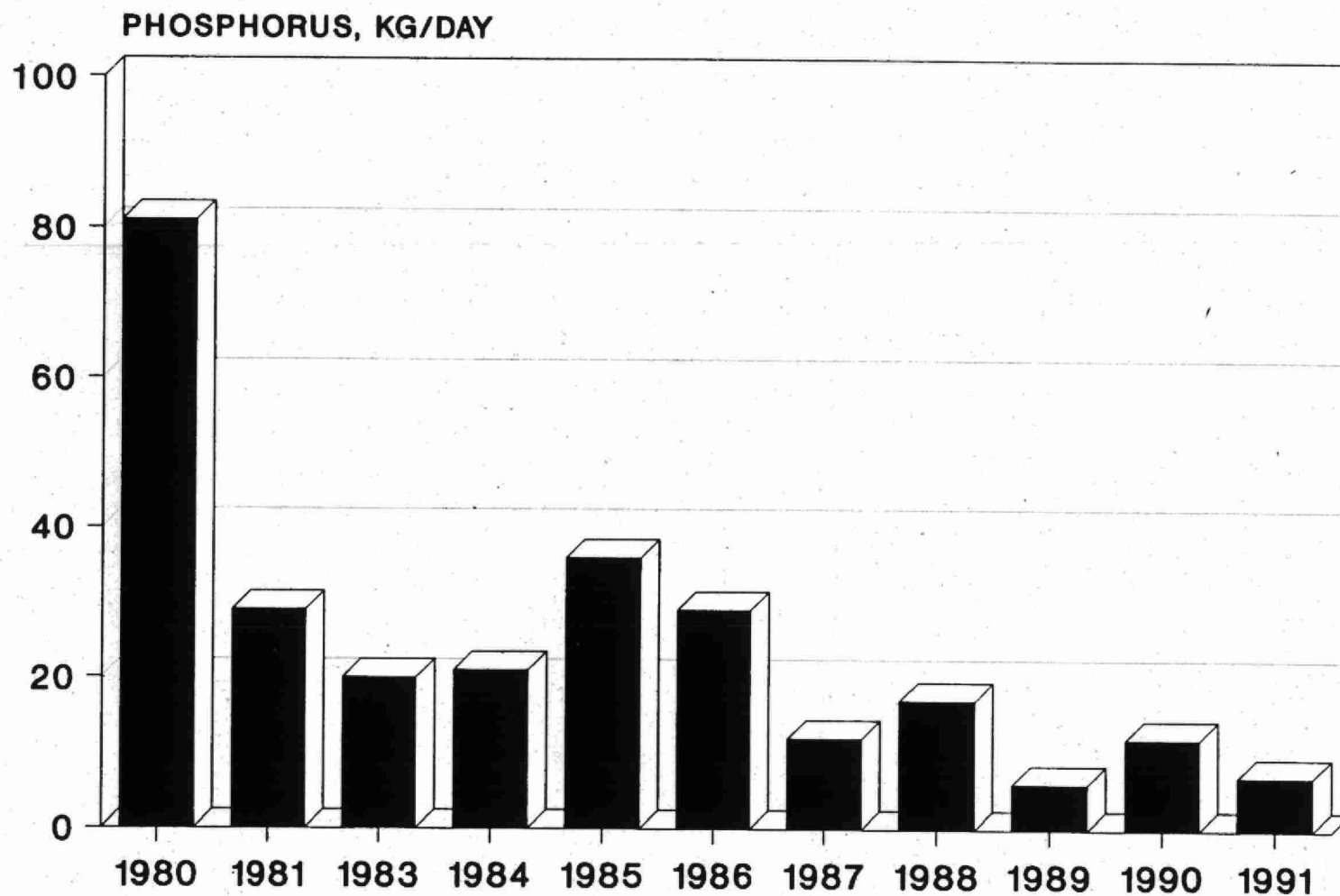
#### Option 6 Incorporate New, Proven Technology at the STP

*Relevant benefits:* The incorporation of new technologies may lead to increased efficiency of waste treatment by the STP, resulting in reduced phosphorus loadings to the harbour; will assist in meeting the STP P loading limit of 2760 kg/year.

**Additional Remedial Actions:** a) Stormwater management through the construction of a vegetated buffer zone along Black Ash Creek in combination with agricultural programs already under way; b) continuation of educational programs aimed at water conservation and control of phosphorus-containing fertilizers and detergents; c) a program encouraging the use of composting and/or water-conserving toilets; d) control effects of grey-water discharge from boats.

**Long Term Remedial Actions:** 1: Industrial Sewage Treatment Plant, 9: Increased Pretreatment at Industry, 3: Tertiary treatment at the STP, 8: New Technologies for Industry.

Fig. 2.4 PHOSPHORUS LOAD FROM THE COLLINGWOOD  
SEWAGE TREATMENT PLANT TO THE HARBOUR



## 2.2 - 2 Bacteria

Levels of bacteria in Collingwood Harbour are generally low, especially during dry periods. Between 1974 and 1986, levels of fecal coliform exceeded 100 counts/100 mL, the Provincial Water Quality Guideline for safe swimming, at several test sites throughout the harbour. But even over that period, bacterial levels were observed to be declining. In 1983 and 1986, for example, most test sites reported fecal coliform levels below 100 counts/100 mL (Figure 2.5). By 1989 and 1990, violations of the Provincial Water Quality Guideline were virtually non-existent during dry periods. Bacterial levels during storm periods have not been confirmed. Testing to date has not been successful in determining these levels since there have been few storm events during the sampling periods, particularly in 1989 and 1990. However, it is likely that during storm events fecal coliform counts are elevated. Bacteriological testing will continue to determine when and where bacterial contamination occurs, and to help predict the length of time following a storm event that body contact should be avoided. But bacterial levels in the harbour during dry periods are not of concern.

### **Problem: Bacteria**

*Impaired Use under Annex 2:*  
**ORIGINAL DESIGNATION** Beach closings

*Relevant PAC Use Goals:* Safe Body  
Contact with Water

*Sources:* Sewage Treatment Plant, Black  
Ash Creek, Oak Street and  
Hickory Street canals

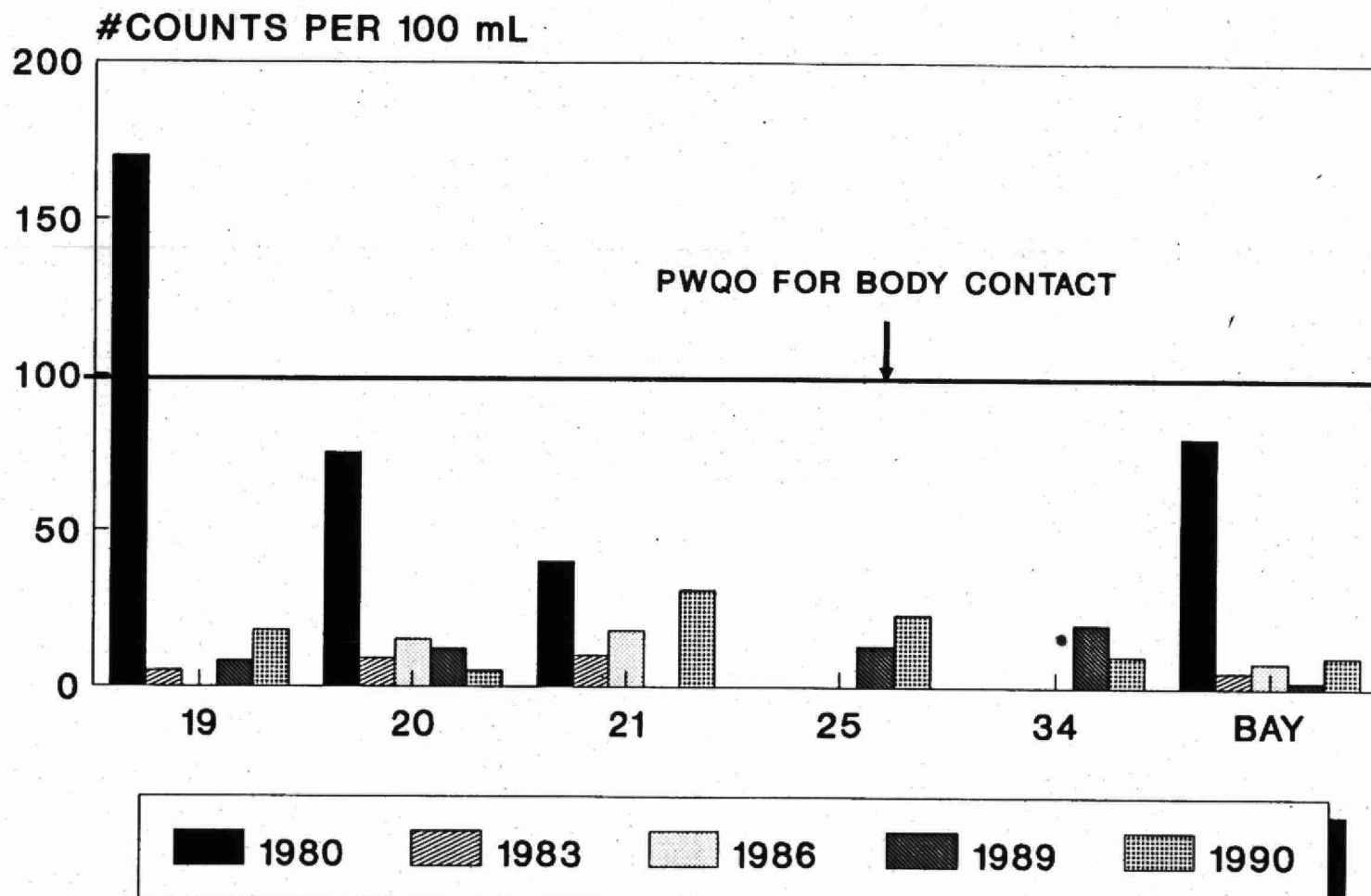
*Status:* Improved in recent years, meets  
provincial objectives for body contact re-  
creation

**Impaired Uses:** Because of marine traffic and the absence of beaches, body-contact recreation is not among the uses of Collingwood Harbour, and is not among the Use Goals approved by the Public Advisory Committee. Bacterial levels do not directly affect, therefore, any of the commercial or recreational uses for the harbour as designated by the PAC. The IJC impaired use of Beach Closings does not directly apply to Collingwood Harbour, again because there are no designated swimming areas. However, the maintenance of water quality at or below provincial bacteriological guidelines during dry periods is among the PAC goals for the harbour, in keeping with the determination that occasional or accidental contact with the harbour's waters during approved-use activities--boating, fishing and nature observation in particular--should not be harmful to health. As well, if in future the harbour will come to include designated swimming areas, bacteriological guidelines for safe swimming must continue to be met. At present, bacterial levels in the harbour do not impair any designated uses.

**Sources:** Approximately 75 per cent of bacteria in the harbour come from the treated effluent of the sewage treatment plant on the south shore of the harbour. The remainder originates in run-off from Black Ash Creek, Hickory Street Canal and Oak Street

Figure 2.5

## MEAN DENSITIES OF FECAL COLIFORMS IN COLLINGWOOD HARBOUR, 1980 - 1990



Canal. Black Ash Creek probably contributes the bulk of this remainder, since the two canals flow only intermittently; however, during storm events the relative contributions from the two canals are likely elevated.

**Status:** As with the occurrence of nuisance algal growth, bacterial contamination in the harbour has diminished substantially over the past decade. Largely responsible are improvements at the sewage treatment plant, which in 1983 began to provide secondary treatment of waste water and underwent system operations improvements in 1986 and 1987. As a result, bacterial levels in 1989, 1990 and 1991 consistently met the Provincial Water Quality Guideline for safe swimming of 100 counts/100 mL during dry periods. In addition, harbour waters met the federal guideline for recreational uses of 200 counts E. coli/ 100 mL. With future improvements at the STP, bacterial levels in the harbour are likely to continue to diminish. As well, with the rehabilitation of Black Ash Creek aimed at erosion control, this source will also diminish.

With proposed commercial and residential expansion in the harbour area, incidental water pollution in the form of littering or grey water may occur with increased boating traffic. Increased intensity of fishing may also contribute to grey-water pollution, which may have fecal-contamination effects in heavily used embayments that are shallow or have confined circulation.

#### **Recommended Remedial Actions:**

##### Option 5 Optimize Operations at the Existing STP

*Relevant benefits:* Optimizing operations will reduce the chances of plant upsets and assist in maintenance of provincial bacteriological guidelines.

##### Option 27 Water Conservation

*Relevant benefits:* A program of water conservation may reduce total loading of bacteria to the STP, resulting in reduced bacterial loadings to the harbour.

##### Option 6 Incorporate New, Proven Technology at the STP

*Relevant benefits:* New technologies may lead to increased efficiency at the STP, resulting in reduced bacterial loading to the harbour.

**Additional Remedial Actions:** a) Stormwater management through the construction of a vegetated buffer zone along Black Ash Creek in combination with agricultural programs already under way; b) continuation of educational programs aimed at water conservation; c) a program encouraging the use of composting and/or water-conserving toilets; d) control grey-water discharge from boats.

## 2.2 - 3 Sediment

Because contaminants in sediment can adversely affect aquatic animals and plants in the food web, ascertaining sediment quality has been particularly important to the RAP evaluation process. Extensive sediment testing was carried out in Collingwood Harbour in 1974, 1983, 1986, 1988, 1989, 1990 and 1991, and showed that sediment quality has generally improved over time. In 1986, levels of PCBs, zinc, lead, phosphorus, Kjeldahl nitrogen and several metals in surficial sediment (3 cm depth and above) exceeded the provincial guidelines for open-water disposal of dredged material. Sediment contamination within the turning basin and near the docks was found to be more extensive than outside the harbour or at the harbour entrance. In 1986, surficial sediment at most stations still exceeded guidelines for phosphorus, copper, chromium and iron. Dredging operations were conducted in the harbour for navigational purposes in 1986, and a general decline in contaminant levels was observed in 1987, probably the result of sediment removal. Twelve stations were sampled, nine of them within the harbour and three in Nottawasaga Bay. By 1987, eight stations within the harbour had acceptable levels of PCBs, nine of the 12 had acceptable levels of copper, 10 were acceptable in lead and zinc, and all stations had cadmium, mercury and nickel concentrations below the provincial open-water disposal guidelines (Table 2.3). Concentrations of phosphorus in sediment still generally exceed provincial guidelines. In 1991, a single station remained with zinc, copper and lead marginally above the provincial guidelines' lowest effect level (currently replaces the open water disposal guidelines), and PCBs were below the detection limit. Sediment quality will continue to be enhanced as new, cleaner suspended material settles and buries more contaminated sediment.

The provincial open-water disposal guidelines are based generally on historical levels of various substances lakewide, and therefore do not necessarily imply that contaminant levels are toxic to biota. Another set of criteria, the 1992 Ontario Ministry of the Environment Sediment Guidelines, is based on the level of sediment contamination and the presence of biota in that sediment; the guidelines require biological testing to determine the environmental effects of sediment contaminants. Similarly, the IJC (IJC 1988, 1989) recommends a comprehensive program of bioassessment when concentrations of contaminants in sediment exceed chemical guidelines. A 1986 Ontario

### **Problem: Sediment Contamination**

*Impaired Use under Annex 2:*  
Restrictions on Dredging  
Activities

*Relevant PAC Use Goals:* Shipping,  
Berthage and Grain Handling;  
Charters; Normal Marine Traffic;  
Boating; Full-service Public  
Marina

*Sources:* Historical, no longer active

*Status:* Improving



**Table 2.3**  
**Mean concentrations of metals, PCBs, oil and grease in Collingwood**  
**Harbour sediments, pre-(1986) and post-(1987) dredging**  
*(All values are in parts per million, except for PCBs, in parts per billion)*

| Station             | PCBs | Cd   | Cr | Cu | Hg   | Ni | Pb  | Zn  | Fe    | Oil and Grease    |
|---------------------|------|------|----|----|------|----|-----|-----|-------|-------------------|
| 19 (1986)           | 66   | .46  | 22 | 25 | .07  | 12 | 34  | 53  | 11025 | 1093              |
| (1987)              | <43  | .54  | 25 | 25 | .06  | 13 | 30  | 30  | 12000 | 519               |
| 20 (1986)           | 65   | .64  | 30 | 41 | .12  | 17 | 58  | 97  | 13500 | 2875              |
| (1987)              | 93   | .61  | 24 | 31 | .08  | 15 | 45  | 83  | 14000 | 1187              |
| 21 (1986)           | 192  | 13.5 | 36 | 72 | .24  | 19 | 133 | 195 | 17000 | 3175              |
| (1987)              | 160  | .77  | 31 | 59 | .12  | 17 | 110 | 190 | 16500 | 2509              |
| 22 (1986)           | 55   | .33  | 18 | 26 | .11  | 9  | 48  | 69  | 9300  | 2370              |
| (1987)              | <20  | <.28 | 17 | 16 | .13  | 6  | 29  | 57  | 7400  | 9027/<br>280      |
| 23 (1986)           | 103  | .62  | 28 | 49 | .23  | 16 | 79  | 115 | 15000 | 4700              |
| (1987)              | 105  | .60  | 29 | 38 | .13  | 16 | 80  | 120 | 15000 | 1162              |
| 25 (1986)           | 40   | .42  | 18 | 25 | .12  | 10 | 34  | 51  | 10200 | 2450              |
| (1987)              | <20  | .39  | 19 | 14 | .03  | 6  | 20  | 40  | 8600  | 2191 <sup>1</sup> |
| 28 (1986)           | 33   | .38  | 17 | 22 | .09  | 10 | 25  | 46  | 9150  | 2250              |
| (1987)              | <20  | .43  | 23 | 24 | .04  | 13 | 32  | 65  | 12500 | 2499              |
| 30 (1986)           | 93   | .61  | 27 | 43 | .14  | 18 | 56  | 94  | 15500 | 2018              |
| (1987)              | <53  | .71  | 27 | 33 | .08  | 14 | 44  | 76  | 14000 | 833               |
| 32 (1986)           | 22   | .22  | 14 | 7  | .03  | 4  | 10  | 19  | 7156  | 934               |
| (1987)              | <20  | .31  | 16 | 10 | .02  | 5  | 13  | 29  | 7200  | 319               |
| 387(1986)           | <20  | .29  | 18 | 19 | .02  | 11 | 10  | 26  | 10350 | 2612              |
| (1987)              | <20  | .45  | 20 | 15 | .01  | 10 | 10  | 30  | 9400  | 530               |
| 388(1986)           | <20  | .26  | 15 | 9  | .03  | 6  | 5   | 10  | 21240 | 596               |
| (1987)              | <20  | <.30 | 15 | 6  | <.01 | 4  | 6   | 12  | 7000  | 142               |
| 393(1986)           | <20  | .32  | 11 | 11 | .06  | 4  | 14  | 31  | 6450  | 1468              |
| (1987)              | <20  | <.30 | 16 | 10 | .02  | 6  | 14  | 35  | 7700  | 487               |
| Dredging Guideline  | 50   | 1.0  | 25 | 25 | 0.3  | 25 | 50  | 100 | 10000 | 1500              |
| Lowest Effect Level | 70   | 0.6  | 26 | 16 | 0.2  | 16 | 31  | 120 | 20000 |                   |

Source: Krantzberg, 1989

Ministry of the Environment study found that bottom-dwelling biota communities within Collingwood Harbour were largely eutrophic (organic-enriched) and pollution-tolerant (oligochaetes and chironomids); however, mesotrophic species were also abundant. Outside the harbour and along the harbour's near shore, relatively few benthic organisms were found, due to the substrate of coarse sand and rocks. Indeed, substrate rather than water quality appeared in the 1986 study to be the determining factor in benthic community structure. While tissue samples of benthos indicated that concentrations of most metals were moderate, at certain sites concentrations of mercury in benthic invertebrates exceeded 1.0 ug/g, which could be of significance in transfer to fish along the food web. However, mercury concentrations in sediment were found to be close to or below detection limits and were well below the guidelines for open-water disposal. As well, measurable levels of PAHs and pesticides were found in benthic invertebrates in some areas, mainly outside the harbour; however, those levels were representative of relatively uncontaminated urban sources, and were not high enough to be considered potentially toxic (Krantzberg, 1989). In sculpins, concentrations of mercury, lead, PCBs, HCB and pp-DDT were found to be low, compared with results of tests performed in other areas of the Great Lakes. Also in 1986, a mollusc-exposure study was conducted to determine the biological availability of contaminants in the water column. Samples of mussels placed at several areas throughout the harbour indicated that few contaminants in the water column are available to biota.

Further bioassays conducted in 1989 (Krantzberg, 1990) and mollusc exposures in 1990 ("Collingwood Harbour Mussel Biomonitoring, 1990" [Krantzberg, 1991]) indicated that levels of lead and zinc in sediment samples collected at the shipyards' dry docks were elevated in comparison with the rest of the harbour, and would be of concern as a toxicity problem to biota if the area were acting as a source of contaminants to the harbour. The testing also showed that the contamination was limited to the shipyards property: a site in the harbour very close to the property was found not to have measurable toxicity. The contaminated sediment in the shipyards property would pose a threat to the harbour's waters only if it were disturbed or improperly managed. An estimated 4000 cubic metres of soft sediment are present in the CSL slips (Public Works Canada 1991).

Sediment collected outside the CSL slips met the biological requirement that toxicity was not significantly different from controls. While some metals marginally exceed the Lowest-Effect Level defined by the provincial guidelines for the protection and management of aquatic sediment quality, the biological testing, as recommended by those guidelines, has demonstrated the absence of measurable toxicity. The 1989 and 1990 bioassays confirmed that contaminant levels had no impact on growth or mortality in the sediment bioassay organisms, and that concentrations of lead and other contaminants in benthos and mussel biomonitors were comparable to those observed in organisms far removed from sources of contamination (Table 2.4). In 1991, PCBs in

TABLE 2.4 TRACE METALS IN MUSSEL BIOMONITORS PLACED IN COLLINGWOOD HARBOUR AND HARBOUR TRIBUTARIES FOR THREE WEEKS, 1990. ALL VALUES ARE  $\mu\text{g.g}^{-1}$  (PARTS PER MILLION) ON A WET WEIGHT BASIS, FOR MUSSEL TISSUE, EXCLUSIVE OF THE SHELL.

| STATION DESCRIPTION |                  | Cu   | Ni   | Pb   | As   | Cd   | Se   | Hg   | Zn   | Mn   |
|---------------------|------------------|------|------|------|------|------|------|------|------|------|
| 13                  | BLACK ASH        | 1.17 | 0.50 | 0.70 | 0.62 | 0.51 | 0.60 | 0.01 | 36.3 | 780  |
| 14                  | OAK ST. CANAL    | 1.73 | 0.43 | 0.63 | 0.77 | 0.58 | 0.77 | 0.01 | 63.0 | 940  |
| 15                  | HICKORY ST.      | 3.77 | 0.43 | 0.63 | 0.58 | 0.43 | 0.90 | 0.01 | 39.3 | 713  |
| 11                  | GOODYEAR         | 2.87 | 0.47 | 0.79 | 0.44 | 0.71 | 0.78 | 0.01 | 41.3 | 1503 |
| 3                   | STP <sup>1</sup> | 0.86 | 0.47 | 0.67 | 0.48 | 0.82 | 0.81 | 0.02 | 31.7 | 456  |
| 21                  | EAST HARBOUR     | 1.06 | 0.47 | 0.67 | 0.44 | 0.41 | 0.96 | 0.01 | 32.7 | 506  |
| 25                  | NAVIGATION       | 1.01 | 0.43 | 0.63 | 0.61 | 0.56 | 1.10 | 0.01 | 40.0 | 546  |
| 32                  | WEST             | 1.33 | 0.47 | 0.67 | 0.74 | 0.83 | 0.90 | 0.02 | 49.7 | 1546 |
| CONTROL             | BALSAM LAKE      | 1.36 | 0.65 | 0.70 | 0.58 | 0.69 | 0.70 | 0.02 | 42.3 | 1134 |

<sup>1</sup>sewage treatment plant, prechlorination

**TABLE 2.5 POLYAROMATIC HYDROCARBONS<sup>2</sup> DETECTED IN SEDIMENT FROM COLLINGWOOD HARBOUR AND THE TRIBUTARIES WITHIN THE HARBOUR WATERSHED, 1990. VALUES ARE IN  $\mu\text{g.g}^{-1}$  (parts per million) DRY WEIGHT. NO SEDIMENT WAS COLLECTED FROM THE STP PRECHLORINATION CHAMBER.**

| COMPOUND                    | DETECTION LIMIT | STATION 11<br>GOODYEAR<br>OUTFALL | STATION 13<br>BLACK ASH<br>CREEK | STATION 14<br>OAK STREET<br>CANAL | STATION 15<br>HICKORY<br>STREET CANAL | STATION 21<br>EAST HARBOUR | STATION 25<br>CENTRE<br>HARBOUR | STATION 32<br>MOUTH OF<br>BLACK ASH<br>CREEK |
|-----------------------------|-----------------|-----------------------------------|----------------------------------|-----------------------------------|---------------------------------------|----------------------------|---------------------------------|--|
| ANTHRACENE                  | 0.01            | <0.01                             | <0.01                            | 0.16                              | <0.04                                 | <0.02                      | <0.01                           | <0.01  |
| FLUORANTHENE                | 0.02            | <0.02                             | <0.02                            | <0.02                             | 0.76                                  | 0.23                       | <0.02                           | <0.02  |
| PYRENE                      | 0.02            | <0.54                             | <0.06                            | 1.40                              | 0.80                                  | <0.20                      | <0.06                           | <0.06  |
| BENZO (a)<br>ANTHRACENE     | 0.02            | <0.02                             | <0.02                            | 0.53                              | <0.04                                 | <0.07                      | <0.02                           | <0.02  |
| CHRYSENE                    | 0.02            | <0.05                             | <0.02                            | 0.62                              | 0.44                                  | <0.10                      | <0.02                           | <0.02  |
| BENZO (k)<br>FLUORANTHENE   | 0.02            | <0.02                             | <0.02                            | 0.27                              | 0.22                                  | <0.11                      | <0.06                           | <0.06  |
| BENZO (a) PYRENE            | 0.04            | <0.04                             | <0.04                            | <0.38                             | <0.24                                 | <0.08                      | <0.04                           | <0.04  |
| INDENO (1,2,3-cd)<br>PYRENE | 0.04            | <0.04                             | <0.04                            | <0.19                             | <0.26                                 | <0.05                      | <0.04                           | <0.04  |

<sup>2</sup> sediment was analyzed for over 40 additional trace organic compounds including other PAHs, organochlorine pesticides, PCBs and mirex. All values were below detection limits

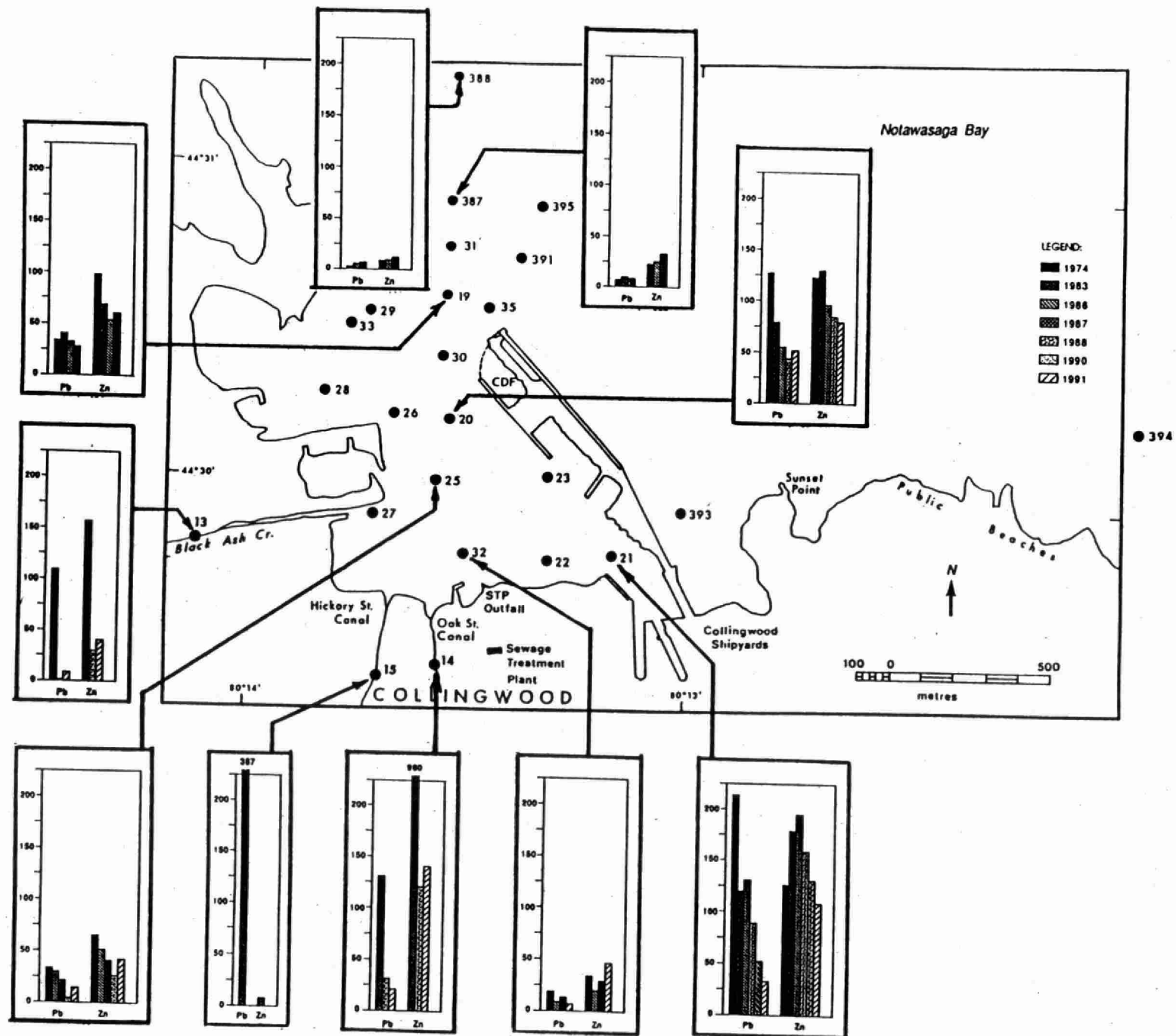


FIGURE 2.6 Lead and Zinc in sediments (ug/g) in Collingwood Harbour, 1974 - 1991.

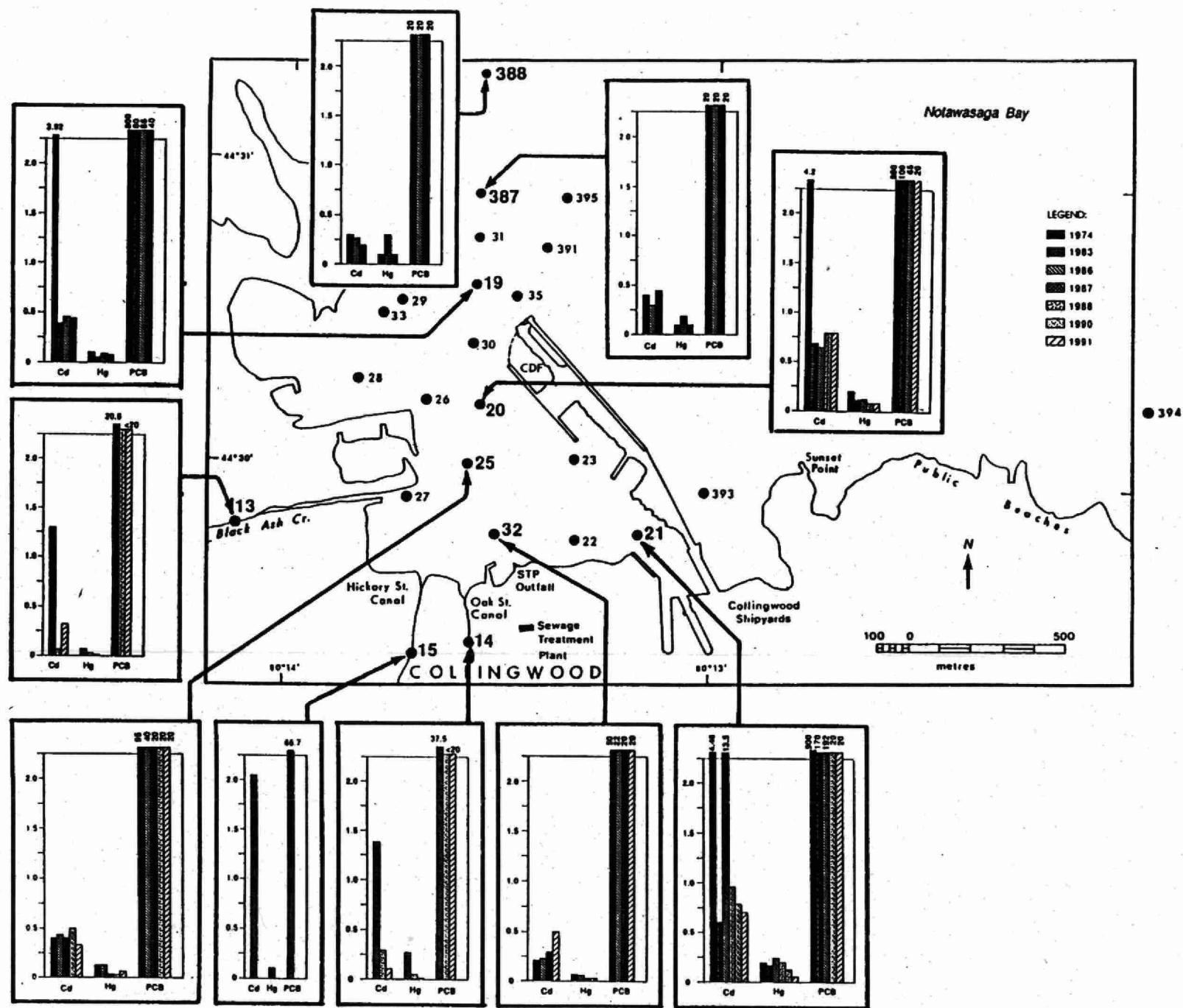


FIGURE 2.6 Cadmium, Mercury and PCB's in sediments (ug/g) in Collingwood Harbour, 1974 - 1991.



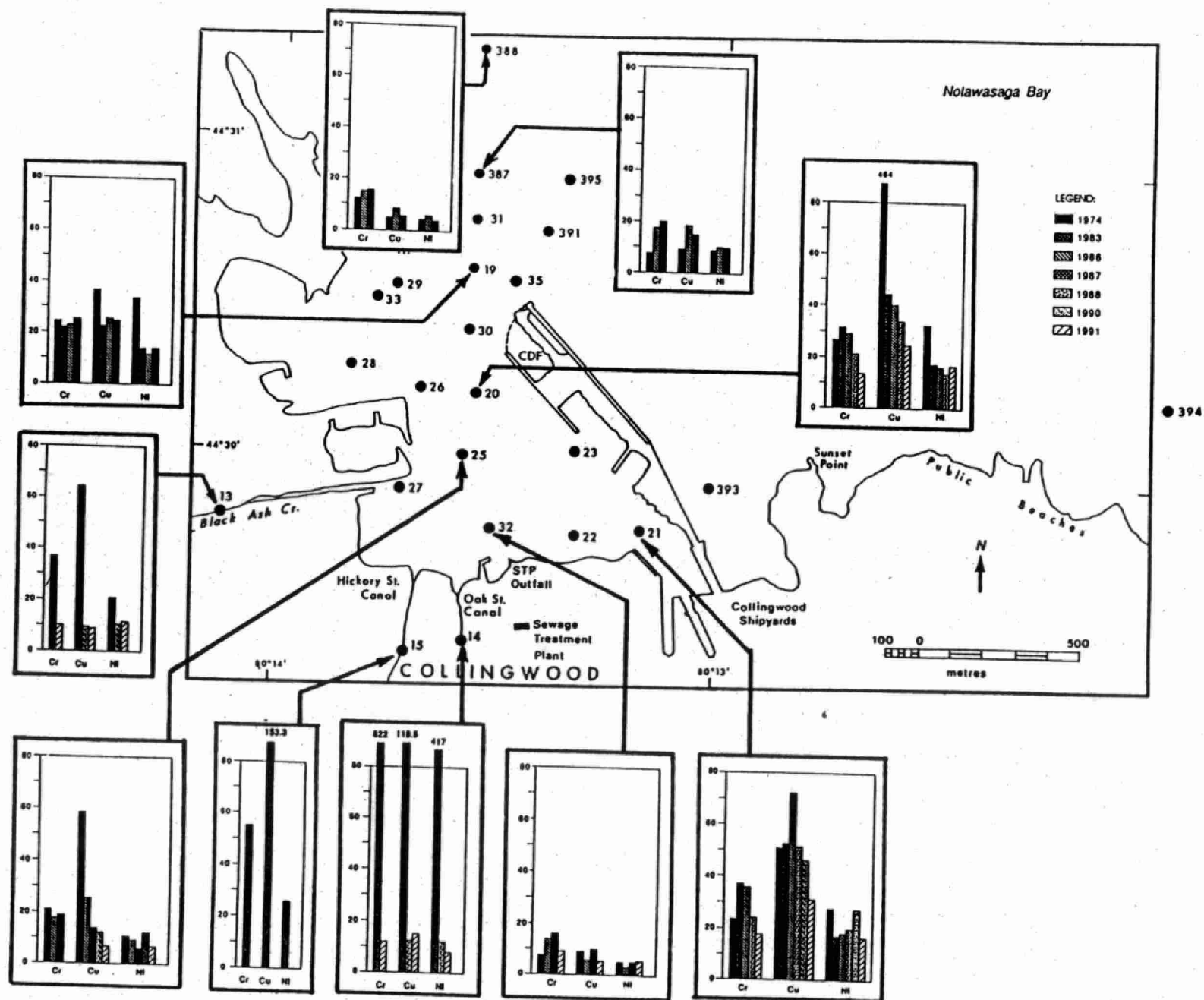


FIGURE 2.6 Chromium, Copper and Nickel in sediments (ug/g) in Collingwood Harbour, 1974 - 1991.

harbour sediments were below detection limits (Table 2.5), and lead, copper and zinc concentrations marginally exceeded the Lowest-Effect Level at only one station in the harbour (Fig 2.6). The multiple lines of evidence provided by laboratory bioassays and field observations of sport fish, benthic organisms and freshwater mussels, spanning five years of study, illustrate that the concentrations of biologically available contaminants in the harbour's sediment are not of toxicological significance. Hence, further detailed examinations on substrate volume and stability were not pursued.

**Impaired Uses:** Metal and nutrient levels that exceed provincial guidelines for open-water disposal of dredged material are consistent with the impaired use of "Restrictions on dredging activity" defined under Annex 2 of the GLWQA. The present levels of sediment contamination do not directly impair any of the commercial or recreational uses for the harbour as approved by the Public Advisory Committee. However, the maintenance of the harbour as a site for normal marine traffic means that the harbour will have to be dredged periodically; improvement of sediment quality so that it meets provincial open-water disposal guidelines would enhance the cost-efficiency of dredging operations. Therefore, sediment quality will affect the PAC Use Goals of maintaining existing shipping, berthage and grain-handling facilities, charters, normal marine traffic and business at the grain terminal, boating and full-service public marina facilities if contaminants are in the turning basin. The presence of elevated zinc and lead levels in the shipyards' property does not affect the harbour waters proper or designated uses, but may do so if the material in the shipyards is improperly managed.

**Sources:** The sources of sediment contamination in Collingwood Harbour are largely historical, and the major contributors are no longer active. Throughout Collingwood's period of industrial and population expansion in the 20th century, the primary income and employment generator was shipbuilding. Because of that industry's necessarily close proximity to the harbour, servicing and building activities at Collingwood Shipyards may have contributed to the degradation of water quality in several ways. Concentrations of metals, particularly lead, in harbour sediment may be the result of the use of paints, the scraping of paint from ship hulls, and the use of shot blast outside the shipyards building. Lead primer was used by the shipyards until the 1950s, and was afterwards replaced by zinc and zinc chromate solutions. Welding-rod bits, enamels and anti-fouling agents, which entered the harbour as a consequence of shipbuilding operations, may be related to levels of lead, zinc and possibly copper in sediment. The use of PCBs in transformers in the vicinity of the harbour may, in part, be responsible for the presence of PCBs in sediment. Although the exact levels of contaminant contribution from the shipyards are now difficult to quantify, disposal of materials directly into the harbour, run-off from building and repair areas, and pump-outs of the dry dock area that occurred until shipyard operations ended in 1986, may all be related to the presence of contaminants, and their current decline in concentrations in Collingwood Harbour.

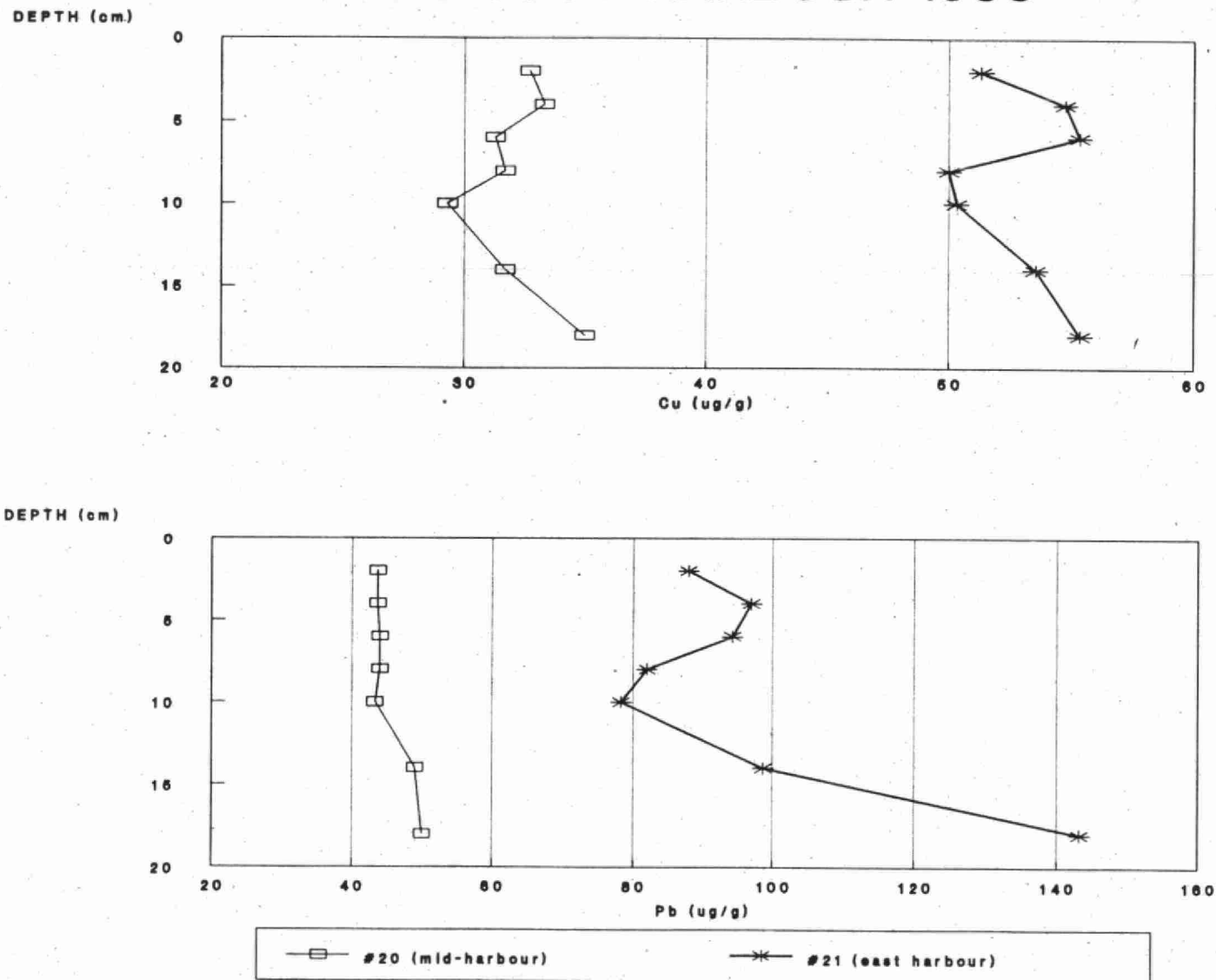
As well, industrial waste loaded to the STP or improperly managed at its source may also have contributed to sediment contamination, but modifications in the industrial

waste stream have largely negated the loading of metals and other contaminants to the harbour sediment from industrial sources (Table 2.6). The sewage treatment plant was also a significant contributor to sediment contamination before treatment improvements were implemented in the 1980s. Currently, PCBs, pesticides and PAHs are below detection levels in STP effluent.

**Status:** The major sources of sediment contamination are no longer active, and sediment quality in the harbour is improving as cleaner material sediments in depositional zones, which were dredged for navigational purposes in 1986. Sediment quality is expected to continue to improve over time. Figure 2.7 illustrates metal profiles in sediment collected outside of the turning basin. Elevated levels of contaminants in the shipyards' property (Fig. 2.8) are confined and do not affect the harbour proper. Only a single station remains that has metals at levels that would restrict open-water disposal; the site is not within the turning basin and does not impair beneficial uses, therefore widespread removal or treatment of sediment is not necessary or advised. Source control and routine navigational dredging will result in lower contaminant levels, and proper management of activities within the shipyard slips will protect the harbour.

Figure 2.7.

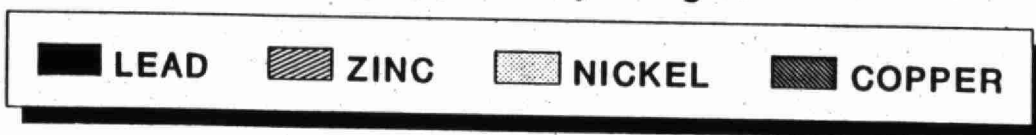
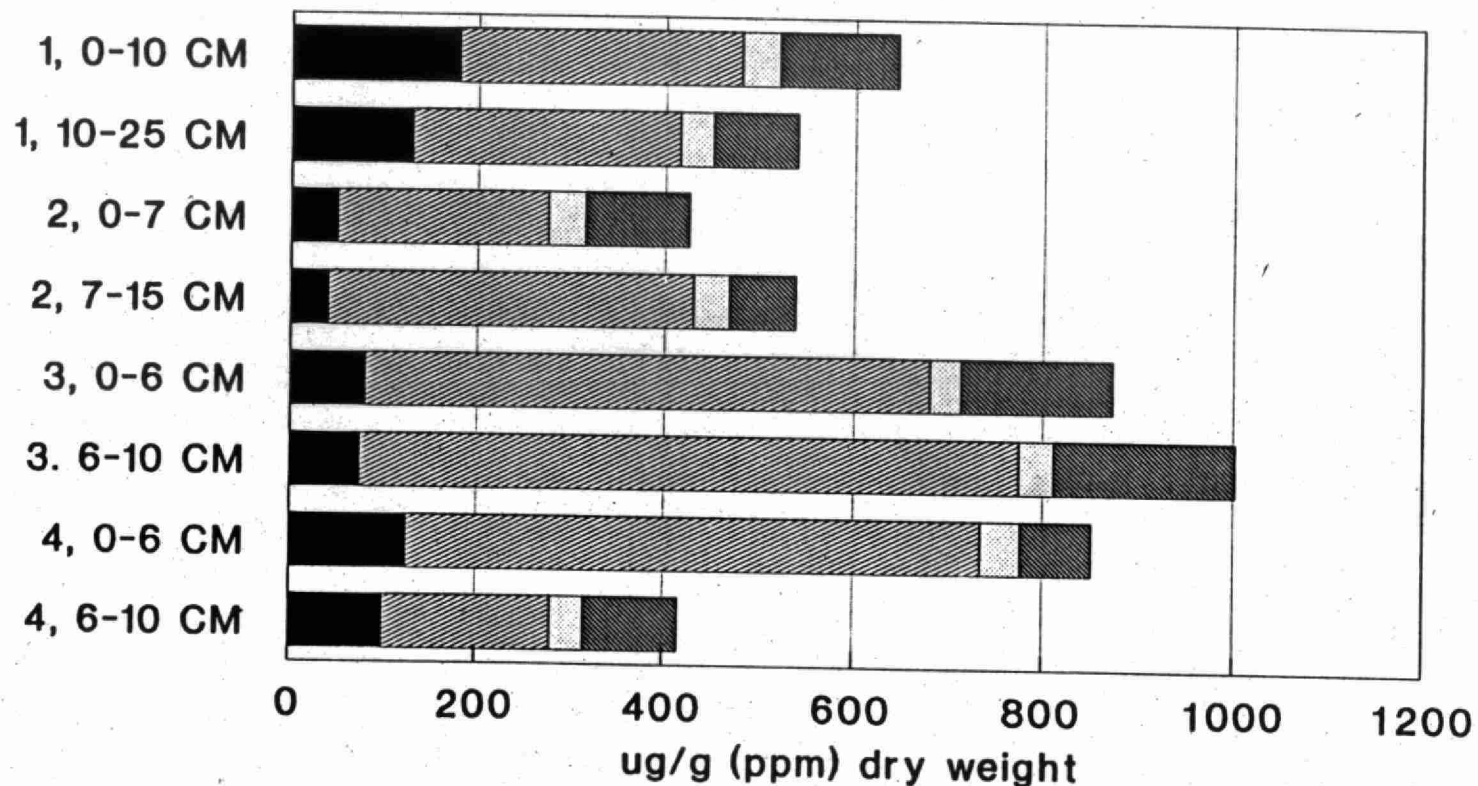
# COPPER AND LEAD PROFILES IN SEDIMENT CORES COLLINGWOOD HARBOUR 1988



Figure

# SEDIMENT CORE CHEMISTRY AT THE COLLINGWOOD SHIPYARDS PROPERTY

CORE NUMBER



**Table 2.6**  
**Current and Historical Industries in Collingwood with Waste Streams of Potential Relevance to Sediment Quality**

| Company               | Product  | Waste Stream of Interest   | Current Treatment  | Comments   |
|-----------------------|--|--|--|--|
| Blue Mountain Pottery | Pottery, Clay Ceramics, oven-to-table ware                     | a) Glaze solution high in metals, especially Pb  | a) Spent glaze—glaze reclamation—filter-cake fired in kiln—Collingwood Industrial LFS<br>• Treated water returned to process<br>• Little or nothing to sanitary sewers               | Past discharge to Black Ash Creek. New process started 1985. No discharge to sanitary sewers.  |
| Collingwood Shipyards | Lake and ocean-going ships, dry dock repairs, hoisting winches | a) Shot blast used outside building<br>b) Pump-out of dry dock<br>c) Site run-off<br>d) Painting | a) Shot recycled; fines collected; inside only<br>b) none<br>c) dependent on housekeeping and inventory<br>d) accumulated scum from spray booths to drums—Collingwood Industrial LFS | • No longer in operation<br>• Lead-based primer discontinued, 1975<br>• no anti-foulant paint used since 1974<br>• testing of sediment in launch basin in 1989 found Pb and Zn contamination |
| Goodyear Canada       | Commercial hose  | • Hose vulcanized with Pb<br>• Zinc stearate use in extruder<br>• various solvents               | • Closed-loop system. Little chance of any discharge to sanitary or storm sewers<br>• Water reprocessed  | • Past discharge to storm sewer to Black Ash Creek<br>• Reprocess tank overflowed to storm sewer; level indicators and controls installed, 1985  |
| Harding Carpets       | Soft floor coverings   | • Dying (some dyes contain organics)   | • Pre-treatment with C filtration, then to sanitary sewers   |  |

**Recommended Remedial Actions:**

**Option 14: Sediment Removal and Confined Storage of Sediment**

*Relevant benefits:* Removing contaminated sediment to a confined storage facility will ensure low contamination levels. Full-scale dredging to fill the CDF will remove restrictions on navigational dredging and could deepen the channel within the harbour.

**Additional Remedial Actions:** a) Construction of a vegetated buffer zone along Black Ash Creek (to reduce erosion and siltation from urban/rural run-off).



## 2.2 - 4 Water Clarity

Water clarity in Collingwood Harbour is generally poor, a condition that is consistent with that of other harbours throughout the Great Lakes. The Provincial Water Quality Guidelines designates a minimum Secchi disc reading of 1.2 m for safe swimming. MOE tests in 1974, 1980, 1983 and 1986 showed that Secchi disc readings did not meet this guideline in several areas throughout the harbour. With improvements at the sewage treatment plant in the 1980s, water clarity has improved; anecdotal evidence suggests that the harbour today is less turbid than it has been in years. In addition, because water clarity is affected by local weather conditions and the growth of algae varies seasonably, the harbour's water meets the provincial guidelines for clarity required for safe swimming at certain times and in certain places (Secchi disc clarity of 120 cm). Surveys conducted in 1990 and 1991 found that Secchi disc depth varied between 60 at the terminal pier wall to 390 cm at the harbour mouth, with average values of 135 in the centre of the turning basin.

| <b>Problem: Poor Water Clarity</b>   |
|--|
| <i>Impaired Use under Annex 2:</i><br>Degradation of Aesthetics,<br>Eutrophication or Undesirable<br>Algae |
| <i>Relevant PAC Use Goals:</i> Sightseeing,<br>Charters, Nature Observation,<br>Boating, Safe Body Contact |
| <i>Sources:</i> Sewage Treatment Plant,<br>Tributaries, Suspended Inorganic<br>Solids                      |
| <i>Status:</i> Improved over past years  |

**Impaired Uses:** Under Annex 2 of the GLWQA, poor water clarity corresponds to the impaired uses brought about by eutrophication or undesirable algae, and degradation of aesthetics. The aesthetic considerations of poor water clarity also relate to the Use Goals for the harbour as approved by the Public Advisory Committee. Because water clarity affects aesthetics, poor water clarity detracts from use of the harbour as a site for nature observation, sightseeing and boating; it could also detract from use of the harbour as a locale for the operation of charters. Poor water clarity may indirectly impair use of the harbour for passive recreation, since it may reduce visibility necessary for safe swimming. While body contact recreation is not among the designated uses for the harbour, improving water quality so that it is safe for occasional/accidental body contact is consistent with the PAC's goals.

**Sources:** Poor water clarity in the harbour results from two factors: nuisance algal growth and the suspension of inorganic solids. MOE surveys conducted from 1974 to 1986 showed that the concentration of chlorophyll *a* in the harbour was not high enough to cause the observed levels of turbidity. Therefore, some of the turbidity is the result of suspended inorganic matter (Figure 2.9). Levels of chlorophyll *a*, used to monitor nuisance algal growth, are partly dependent on the availability of nutrients in the water; the primary source of nutrients, particularly phosphorus, to the harbour is

the sewage treatment plant. Suspended sediment inputs from Black Ash Creek contribute to overall turbidity.

**Status:** In the 1980s, operational upgrades and improvements implemented at the sewage treatment plant resulted in decreased loadings of nutrients to the harbour. As a result, water clarity, which is partly the result of the growth of algae, has generally improved in recent years. With further operational improvements at the STP, water clarity should continue to improve.

As with the problems of bacteria and nuisance algal growth, proposed commercial and residential development of the harbour may have implications for water clarity, particularly in the form of grey-water pollution and increased loadings to the STP. As well, the continuation of recreation and tourism in the harbour will be partly dependent on water-clarity considerations.

**Recommended Remedial Actions:** Same as those for 2.2 - 1 Nuisance Algal Growth above.

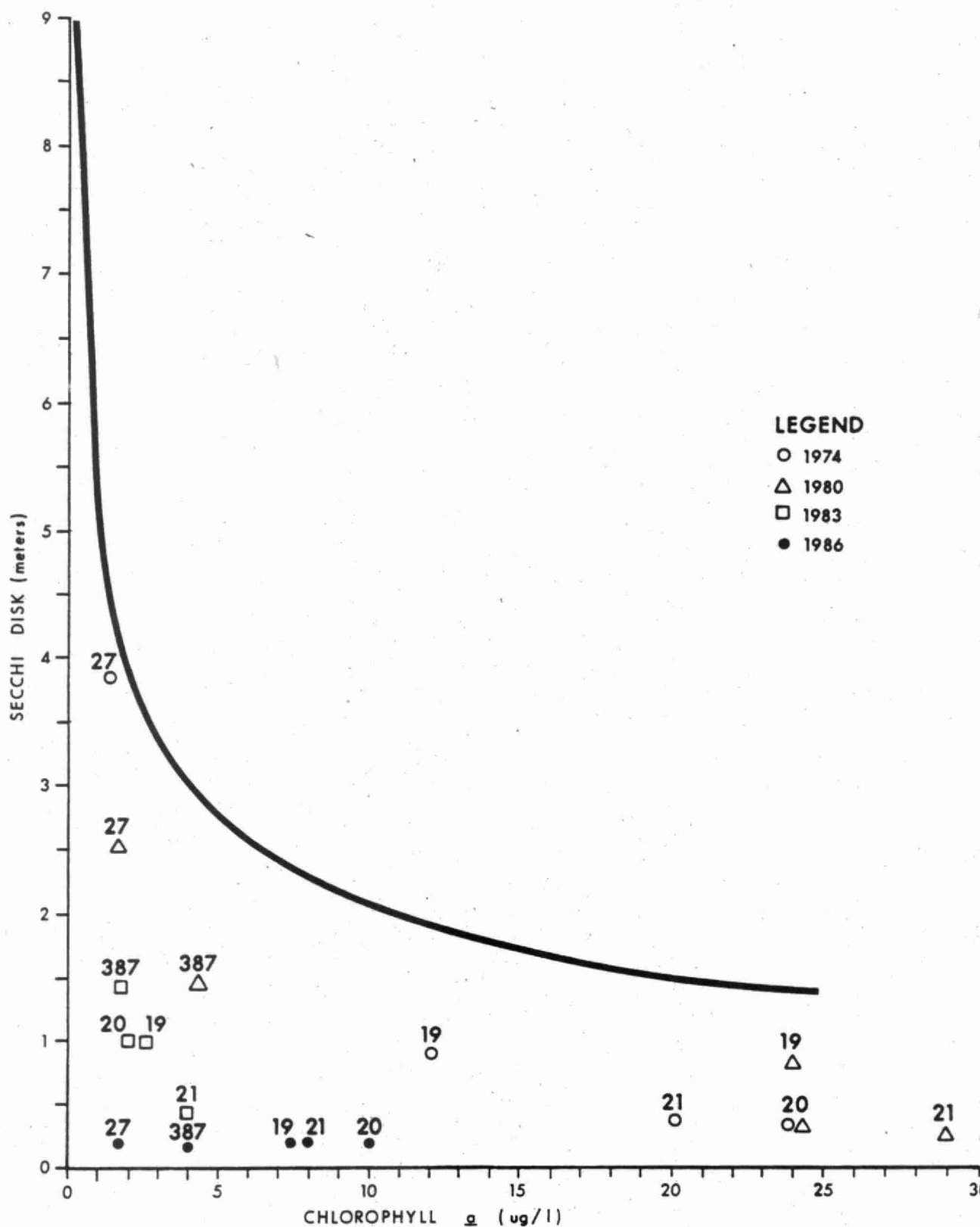


FIGURE 2.9 The relationship between Chlorophyll *a* and Secchi disk depth for stations sampled in September 1974 - 1986 (values for 1986 are for Chlorophyll *a* only). Secchi disk depth greater than 1.2 m meets the provincial objective for safe swimming.

## 2.2 - 5 Loss of Fish and Wildlife Habitat

With the development of Collingwood Harbour as a site for industry and tourism, much of the natural fish and wildlife habitat in the immediate harbour area was destroyed. In developing the harbours industrial uses, a significant portion of wildlife habitat was filled in and rendered unavailable to the many species that make use of the harbour. The level of this destruction was consistent with that occurring at other harbours in the Great Lakes.

Today, the southwest portion of the harbour is designated as a provincially significant Class 2 Wetland by the Ontario Ministry of Natural Resources, largely because of the wide variety of bird and fish species that the area supports, as well as the opportunities it provides for fish spawning. According to the MNR classification, all wetlands of this class must be preserved; the Town of Collingwood has consequently zoned the wetland area for environmental protection.

The harbour habitat supports a wide range of fish species, from warm-water populations of yellow perch and smallmouth bass to migrant rainbow and lake trout in the spring and fall. Smallmouth bass spawn along the west shore of the harbour, and there is a significant spawning bed outside the harbour, just east of the eastern spit. An extensive fish inventory in 1986 found 36 species of fish in the harbour, with white sucker and smelt identified as the most abundant species; sport fish accounted for less than four per cent of the catch (Table 2.7). The two major types of fish habitat in the harbour are rocky rubble areas and submergent or emergent weed beds (Table 2.8). While 10 species of macrophytes were identified in a sampling undertaken in 1986, the dominant water plant is milfoil in the nearshore areas of the harbour and those in the deeper water close to the sewage treatment plant.

A creel survey conducted in April/May 1991 found that catch per unit effort for backcross and rainbow trout was fair to good. The fish populations shifted in May as temperatures increased and a warm-water fishery was established. The decline in yellow perch populations is consistent with observations throughout Georgian Bay and may be attributable to climatic factors and/or to competitor and predation resulting from salmon stocking. Large number of smallmouth bass were observed in the harbour during the 1991 angling season.

|   |
|---|
| <b>Problem: Loss of Fish and Wildlife Habitat</b>   |
| <i>Impaired Use under Annex 2: Same</i>   |
| <i>Relevant PAC Use Goals: Sustained fish and wildlife levels, Fishing, Sightseeing, Nature Observation</i> |
| <i>Sources: Historical, consistent with development of area</i>   |
| <i>Status: Protected, provincially and municipally</i>  |

**Table 2.7**  
Summary of fish inventory for Collingwood Harbour,  
1986

| <u>Species</u>       | <u>Species</u>     |
|----------------------|--------------------|
| Alewife              | Rock bass          |
| Banded killifish     | Sand shiner        |
| Blacknose dale       | Shorthead redhorse |
| Bluntnose minnow     | Silver redhorse    |
| Bowfin               | Smallmouth bass    |
| Brassy minnow        | Spottail shiner    |
| Brook stickleback    | Trout-perch        |
| Brown bullhead       | Walleye            |
| Burbot               | White bass         |
| Carp                 | Whitefish          |
| Central mudminnow    | Yellow perch       |
| Chinook salmon       |                    |
| Common shiner        |                    |
| Emerald shiner       |                    |
| Gizzard shad         |                    |
| Greater redhorse     |                    |
| Johnny darter        |                    |
| Lake trout backcross |                    |
| Log perch            |                    |
| Longnose gar         |                    |
| Mimic shiner         |                    |
| Moxostoma spp.       |                    |
| Northern pike        |                    |
| Pumpkinseed          |                    |
| Rainbow smelt        |                    |

**Table 2.8**  
Aquatic vegetation, Col-  
lingwood Harbour, 1986

|   |
|---|
| Cattail ( <i>Typha</i> spp.)                      |
| Waterweed ( <i>Anacharsis canadensis</i> )        |
| Bulrush ( <i>Scirpus</i> spp.)                    |
| Lesser duckweed<br>( <i>Lemna minor</i> )         |
| Coontail<br>( <i>Ceratophyllum demersum</i> )     |
| White water lily<br>( <i>Nymphaea</i> spp.)       |
| Water milfoil ( <i>Myriophyllum spicatum</i> )    |
| Tapegrass<br>( <i>Vallisneria americana</i> )     |
| Curly pondweed ( <i>Potamogeton crispus</i> )     |
| Water smartweed<br>( <i>Polygonum amphibium</i> ) |

**Impaired Uses:** The historical destruction of wetland areas in the harbour corresponds to the Annex 2 impaired use of loss of fish and wildlife habitat. The Public Advisory Committee has also designated as one of the Use Goals for the harbour that fish and wildlife levels within the harbour are sustained. As well, a healthy and viable fish and wildlife community contributes to the PAC Use Goals of nature observation, sightseeing and sport fishing. In order for that goal to be achieved--the maintenance of current levels of fish and wildlife--it may be necessary in the future not only to preserve existing wetlands, but to participate actively in the rehabilitation of habitat.



**Sources:** The destruction of fish and wildlife habitat is largely historical, having been contemporaneous with the development of the harbour as a residential, commercial and industrial site. In many ways, the town of Collingwood grew up and thrived because of its harbour. The earliest recorded inhabitants were the Tionnate tribe in the 17th century. In 1833, Nottawasaga Township was created, paving the way for settlement of the area by whites. A steam saw and grist mill were built in 1853, followed two years later by the construction of a rail terminus by Northern Railway. By 1857 steamship routes to the harbour had been opened. Use of the harbour as a rail and Great Lakes transportation site resulted in rapid growth and development. In 1882, a dry dock and shipbuilding works were built in the southeastern corner of the harbour by the Queen's Dry Dock and Ship Building Co., later to become Collingwood Shipyards. Collingwood Terminals took advantage of the harbour as a rail and Great Lakes terminus by building a grain-handling facility on the harbour's eastern shore in 1928. More recent developments on harbour-adjacent lands include the Collingwood Yacht Club, to the south of the elevator; two marinas on the western shore; and two condominium and recreational complexes, also on the western shore.

In addition to historical destruction of fish and wildlife habitat, there is the added threat of loss of integrity of the existing wetland as a result of the invasion of purple loosestrife (*Lythrum salicaria*).

According to extensive MNR and Environment Ontario studies of the harbour biota, there is no evidence to suggest that contaminants are responsible for degradation of fish and wildlife populations. During the 1986 inventory, yellow perch, white sucker and walleye were tested for concentrations of mercury, PCB, mirex, DDT, chlordane, lindane, aldrin, heptachlor, hexachloro-benzene and octachlorostyrene. The samples indicated that all three species met federal guidelines for unrestricted consumption. Transient whitefish and chinook salmon were also found to be well within the unrestricted-consumption guidelines. The only restriction on fish consumption applies to yellow perch over 14 inches in length. In 1984, one perch over 14 inches was caught, and subsequently found to have concentrations of mercury of 0.54 ppm, above the federal guideline of 0.50 ppm for unlimited consumption. In 1991, however, two perch over 14 inches were caught by local anglers and analysed by the Ontario Ministry of the Environment. Mercury concentrations in those fish were less than 0.35 ppm, below the consumption guidelines. As well, spottail shiner surveys conducted in the fall of 1985, 1986 and 1987 indicated that metals and chlororganic compounds are not significantly available to fish in Collingwood Harbour. Only PCBs were found to be at elevated levels in spottail populations, especially around the sewage treatment plant and near the shipyards. However, sediment studies of both areas did not support their being considered as sources of PCB contamination, and PCB concentrations in benthic communities in those areas were not elevated. In 1989 and 1990, PCB concentrations in shiners were 0.089 and 0.086 ug/g, respectively--below the 0.1 ug/g guideline for protection of aquatic life. The levels of PCB found by the surveys were well below the limit beyond which consumption is not recommended. PAH residues in shiner populations declined from 232 ng/g in 1987 collections to 141 ng/g in 1990. There are no guidelines or objectives to assess the importance of these residue values. However, PAH residues in 1990 shiners collected from Collingwood Harbour



were similar to several other collections from the Great Lakes (Suns, MOE, personal communication).

**Status:** The historical expansion that brought about the original destruction of fish and wildlife habitat has now largely ceased. Today, the wetlands in the harbour are protected to the extent possible by agency policies and the Town's zoning of the area as environmentally protected. The RAP and the Public Advisory Committee have also recognized that the enhancement of fish and wildlife habitats is a desired long-term goal for the harbour. The RAP Team and Public Advisory Committee, with assistance from the Town and local environmental organizations and clubs has helped organize a program to continually remove purple loosestrife by mechanical means until such time as a control program for this "noxious" weed is developed through Ontario Ministry of Natural Resources, other government agencies and interest groups. In addition, the Town has constructed numerous nesting boxes within the wetland to enhance colonization by avian species. Due to the location of the wetland within an urban environment, measures to control "nuisance species" such as Ring-billed Gulls are not emphasized. In the long term, measures may be considered to control these species.

Two possibilities for development of lands directly adjacent to the harbour may have an impact on fish and wildlife habitat. One is a proposal by Canada Steamship Lines to redevelop the old shipyards site in the southeastern corner of the harbour. The other significant possibility for development of adjacent lands is described in the Town of Collingwood's *Waterfront Master Planning Report*, which proposes a comprehensive redevelopment of Collingwood's waterfront lands (see Section 3.1-2). The Collingwood Harbour RAP Team has been and continues to be involved in contributing responses to plans for harbour development as they relate to issues of water quality. Members of the Public Advisory Committee are actively involved in the planning committees (Town Council, CSL, and others) that have proposed new developments. They are, therefore, fully aware of the areas in which the proposals overlap or conflict with the RAP mandate. Whatever redevelopment may or may not be implemented, the RAP Team and the PAC will monitor and consult with the relevant parties, and take an active role in planning, to ensure that habitat is preserved and rehabilitated and that plans for improvement in environmental conditions in the harbour continue.

## **Recommended Remedial Actions**

### Option 10 Wetland Preservation/Conservation

*Relevant benefits:* Continuing wetland preservation/conservation, as reflected in the Town's Official Plan and recognized by provincial and federal agencies, would contribute to the maintenance of harbour wetland areas as habitat for significant fish and wildlife populations.

### Option 11 Habitat Rehabilitation

*Relevant benefits:* Rehabilitation, to be implemented to maintain and enhance fish and wildlife populations when the opportunity arises, would expand fish and wildlife habitat for use by a diversity of aquatic and semiaquatic organisms, and would support PAC Use Goals for nature observation and sport fishing.

**Additional Remedial Actions:** a) Construction of a vegetated buffer zone along Black Ash Creek, in combination with agricultural programs; b) Purple Loosestrife Control Program.

### **III. THE SELECTION PROCESS FOR PREFERRED OPTIONS**

**RAP PRINCIPLES AND SUPPORTING TECHNICAL INVESTIGATIONS  
APPLIED TO THE SELECTION OF REMEDIAL ACTIONS**

### III. SELECTION OF PREFERRED OPTIONS FOR REMEDIAL ACTION

*On September 19 and 20, 1991, members of the Public Advisory Committee and the RAP Team attended a special workshop designed to create, from a list of options, a set of preferred options for remedial action, complete with a sequence for implementation. The consensus that was achieved at the workshop, and which is described in detail for the options in the following pages, forms the basis of the delisting strategy for Collingwood Harbour presented in this document.*

#### 3.1 REACHING THE GOAL: SELECTION OF PREFERRED OPTIONS

The Sept. 19-to-20, 1991, workshop on remedial action was attended by members of the Public Advisory Committee, the RAP Team and representatives of the local press, as well as a facilitation team. The purpose of the workshop was to move the Collingwood RAP process from the list of options described in *Making Choices: A Discussion Paper on Remedial Options* (Appendix III) to a strategy for delisting the harbour as an Area of Concern. The participants at the workshop were called upon to select options on the basis of four central criteria:

- a) the options' contribution to restoration of water quality and the delisting of Collingwood Harbour;
- b) their meeting the PAC's Use Goals;
- c) their meeting the PAC's evaluation criteria;
- d) consideration of public comment.

As a first step, a draft set of remedial actions was developed at a preliminary meeting by members of the PAC Technical Subcommittee in consultation with the RAP Team. The participants at the delisting strategy workshop devoted the first session to a review of the draft strategy. Participants had the opportunity to clarify the wording of options presented in the draft, and to ask questions regarding both technical and non-technical details. For example, the importance of water conservation efforts was discussed and agreed on, on the basis that total hydraulic flow to the sewage treatment plant, when multiplied by the phosphorus concentration in effluent, determines total phosphorus loading to the harbour. The role of public consultation was also discussed, and the group concluded that the televised Town Council meeting to be held on Oct. 28, 1991, just prior to the municipal elections, would provide a suitable forum for presentation of the delisting strategy to the community.

At the second workshop session, the group discussed in detail each option in the draft delisting strategy. The purpose of the selection workshop was to reach 100-per-cent consensus on preferred options to form a delisting strategy for Collingwood Harbour.

## 3.2 - Principles Applied In Selection of Options

### 3.2 - 1 The Ecosystem Approach

Annex 2 of the Great Lakes Water Quality Agreement requires that RAPs "shall embody a systematic and comprehensive ecosystem approach to restoring and protecting beneficial uses in Areas of Concern or in open lake waters." In keeping with that requirement, the Collingwood Harbour RAP and Public Advisory Committee are committed to following the ecosystem approach in all of their activities. As a result, participants in the RAP are guided by the ecosystem philosophy in both goals and methodology. Because the philosophy demands that all facets of the ecosystem be taken into account, the RAP is not limited to Collingwood Harbour proper, but considers land-use patterns in the surrounding watershed, including the Town itself, in light of potential sources of contamination. Methodologically, remedial actions must be consistent with a respect for the entire Collingwood Harbour ecosystem, and therefore must be selected with a view not only to their effects on water quality in the harbour, but also to their effects on the human, animal and plant populations that co-exist in the harbour environment. One element of the ecosystem should not be favoured over another, or benefit from remedial actions to the detriment of another participant in the ecosystem. In all cases, pollution prevention or control of contamination at the source is considered the highest priority in the development and selection of preferred options.

**Human Health** considerations are embodied in this approach. By protecting the harbour ecosystem and controlling the sources of pollution, water quality in Collingwood Harbour's drainage basin has and will continue to achieve a level that ensures an enduring high standard of human health and well-being.

During the discussion phase inaugurated by *Making Choices: A Discussion Paper on Remedial Options*, the community was asked to keep the ecosystem approach in the forefront of their evaluations of remedial options. Similarly, at the delisting strategy workshop, the basic demand of the ecosystem approach placed great importance on pollution prevention and control of contaminants at the source. One of the fundamental questions for the selection of preferred options was, **Will the options form the basis for sound, long-term ecosystem management to improve and protect water quality in Collingwood Harbour?**

### 3.2 - 2 Virtual Elimination of Persistent Toxic Substances

In a June, 1991, meeting, the Collingwood Harbour RAP Team and the Public Advisory Committee met to define their approach to the principles of zero discharge and virtual elimination of persistent toxic substances. Article II of the 1987 amendment to the Great Lakes Water Quality Agreement requires the parties to eliminate or reduce to the maximum extent possible the discharge of all pollutants. In addition, the article calls for the *virtual elimination* of the discharge both of toxic substances in toxic amounts and of persistent toxic substances, which are defined by the International Joint Commission as "any toxic substance[s] with a half-life in water of greater than eight weeks." Furthermore, Annex 12 of the GLWQA calls for regulatory strategies to control or prevent the discharge of persistent toxic substances in accordance with the philosophy of *zero discharge*.

Zero discharge is more exacting than virtual elimination, since it implies that persistent toxic substances will not be disposed in the Great Lakes system. Under the philosophy of zero discharge, *no* persistent toxic substances are given the opportunity to enter the ecosystem. Virtual elimination, on the other hand, is a route towards zero discharge. As a methodology rather than a goal, virtual elimination does not assume that persistent toxic substances will eventually be reduced to zero in the environment. The technological capability to measure contaminants in the ecosystem continues to improve, and some persistent toxic substances occur naturally. Taking those realities into account, virtual elimination provides a means for working towards the complete elimination of these substances. The practice of virtual elimination, to which the parties are obliged under the amendment to the GLWQA, can be applied in the legislative, technological or economic realms of activity to prevent the formation of specific toxic compounds, treat potential discharges and remedy existing contaminated ecosystems.

The participants in the Collingwood Harbour RAP have agreed upon four principles for virtual elimination:

- 1) Complete removal of persistent toxic substances from the ecosystem once the substance is present, and the complete removal from a source (zero discharge) once a substance has been produced, may not be possible. Therefore, in striving for zero discharge of persistent toxic substances, the formation and discharge of such substances shall be virtually eliminated.
- 2) The strategy for virtual elimination will be effective only if the actions are feasible and have measurable goals. Technological advances may be required to achieved virtual elimination.
- 3) Socioeconomic factors must be included in the virtual-elimination strategy. Can we afford to take a specific action? Can we afford not to?
- 4) It is recognized that some sources are controllable, but may not be feasible to eliminate completely, such as leaching from landfill sites. As such, zero discharge may be the ideal goal, but may not be realistically achievable.



The RAP Team and the PAC recognize that zero discharge of persistent toxic substances is the only method to virtually eliminate such compounds. They also recognize, however, that while zero discharge of all compounds may not be realistically achievable, virtual elimination should be the philosophy used in setting forward remedial actions for the restoration of the Great Lakes Basin. In light of this philosophy, pollution prevention initiatives received high priority in the evaluation of remedial options.

### **3.2 - 3 PAC Criteria for Selection of Preferred Options**

In April, 1990, the Public Advisory Committee developed the following criteria for evaluating remedial options (see Section 1.7):

- *Does the proposed remedial measure meet the community's agreed-upon uses and goals for the harbour?*
- *Is it cost effective?*
- *Is it practical?*
- *How will it affect landowners?*
- *Is it acceptable to the public?*
- *Is it a permanent solution?*
- *Is it easy (realistic) to continue or maintain?*
- *Does it allow the harbour to be delisted as an Area of Concern?*
- *Will it achieve the results in an acceptable time period?*
- *Is responsibility for the remedial measure shared?*
- *What is its impact on existing and proposed land uses?*
- *Does it temporarily affect the use of the harbour when it is implemented?*

### **3.3 Research Used for Development of Preferred Options**

#### **3.3 - 1 *Process Audit of Collingwood Sewage Treatment Plant***

To establish the capacity of the current Collingwood sewage treatment plant (STP) and to develop approaches for optimizing existing liquid- and sludge-processing operations, the Town of Collingwood, with the co-operation of the RAP Team, retained a consultant to conduct process-specific studies with the assistance of a computer-enhanced process audit. This approach provides process operating and design information that is generally not available from desktop evaluation of unit processes. The main objectives of the project were:

- to define the capacity of the existing liquid and sludge treatment unit processes;
- to determine the extent and cost of system upgrading/expansion required to eliminate current capacity bottlenecks and to meet future growth and potential effluent quality requirements of the RAP.

Funding was provided by the municipality, the federal Great Lakes Cleanup Fund, the RAP and Ontario Hydro.

Based on flow projections, the yearly average flow to the Collingwood STP will approach but not exceed the current rated plant hydraulic capacity in the year 2001, excluding industrial reserve capacity. Given the uncertainty associated with the population projections beyond the year 2001, an appropriate approach for expansion considerations is the use of the industrial reserve capacity for other development (i.e. residential, commercial/light industrial).

Monthly average concentrations of total phosphorus in STP effluent for 1989/90 were consistently below the criterion of 1 mg/L, with a single exception, which was associated with a car-wash soap spill that resulted in influent total P concentration of up to 27.6 mg/L and effluent total P concentration of 1.07 mg/L. Yearly average effluent total P concentrations were 0.52 and 0.68 mg/L in 1989 and 1990, respectively, and 0.42 mg/L during the consultant's online monitoring period. If the single sample associated with a clarifier upset during stress testing is excluded, the average effluent total P concentration was 0.28 mg/L during the monitoring period. That suggested that alum addition for P removal was adequate for soluble P removal, including the maximum primary effluent filtered P concentration of 6.29 mg/L.

Two approaches were developed to optimize the phosphorus removal system at the Collingwood STP:

- *Alum addition pump control based on a flow/load pacing mechanism*

To optimize soluble P removal, the installation of a control loop using online P analysers in conjunction with automatic pump control was recommended. The feasibility of measuring P continuously in an STP environment has been recently demonstrated. However, the use of a chemical addition is an innovative optimization approach that has not been demonstrated at an STP in Ontario.

- *Investigation of dual-point chemical addition*

Alum addition to the primary clarifiers, with or without alum addition to the end of the aeration train, may reduce the particulate P by reducing the P content of the mixed liquor. Dual-point chemical addition may affect other aspects of the treatment process, such as increased BOD<sub>5</sub> and total suspended solids removals in the primary clarifier. To evaluate the dynamics of a dual-point P removal system, jar tests, followed by a full-scale field evaluation, were recommended. The evaluation should determine the required dosage rates, effective removals, final effluent total P concentrations achievable by dual-point addition, and impacts on sludge formation.

Implementation of these two optimization approaches will demonstrate the final effluent total P concentration that may be consistently achieved by chemical addition. Additional plant-improvement details are summarized in Table 3.1.

TABLE 3.1

| Table ES.1<br>Capital and Study-Related Expenditures |  |  |                           |                             |
|--|--|--|---------------------------|-----------------------------|
| Subject  | Action   | Reasons  | Study-Related Expenditure | Capital                     |
| Oxygen Transfer Capacity                             | <ul style="list-style-type: none"> <li>Implement DO control strategy (excluding computer system and PLC)</li> </ul>  | <ul style="list-style-type: none"> <li>Energy savings</li> <li>Improved performance monitoring</li> </ul>  | -                         | \$118,000                   |
| Phosphorus Removal System                            | <ul style="list-style-type: none"> <li>Chemical addition pump control and monitoring instrumentation               <ul style="list-style-type: none"> <li>a) Computer system and PLC</li> <li>b) Online P-analyzer, pump replacement and monitoring instrumentation</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>Optimize soluble and particulate phosphorus removal (without tertiary filtration)</li> <li>Provide online monitoring data for improved SRT control and sludge management</li> </ul> | a) -                      | a) \$102,000                |
|  | <ul style="list-style-type: none"> <li>Evaluate dual point chemical addition</li> </ul>  |  | b) \$15,000<br>- \$25,000 | b) \$212,000                |
|  | <ul style="list-style-type: none"> <li>Evaluate dual point chemical addition</li> </ul>  |  | \$15,000<br>\$25,000      | \$12,000                    |
|  | <ul style="list-style-type: none"> <li>Final effluent filtration (if required following implementation of optimization approaches)</li> </ul>  | <ul style="list-style-type: none"> <li>Achieve proposed RAP total phosphorus concentration of 0.31 mg/L at rated plant capacity</li> </ul>   | -                         | \$6.3 M                     |
| WAS Thickening                                       | <ul style="list-style-type: none"> <li>Evaluate DAF performance improvement opportunities</li> </ul>   | <ul style="list-style-type: none"> <li>Determine feasibility of improving DAF capacity in short-term by design modifications</li> </ul>  | \$5,000                   | To be determined by study   |
|  | <ul style="list-style-type: none"> <li>Evaluate design parameters and install gravity belt thickener</li> </ul>  | <ul style="list-style-type: none"> <li>Determine design basis of GBT</li> <li>Provide adequate WAS thickening for SRT of 8 - 10 days</li> <li>Improve primary clarifier performance (without co-thickening)</li> </ul>     | \$25,000                  | \$1.7 M                     |
| Anaerobic Digestion                                  | <ul style="list-style-type: none"> <li>Cleanout digesters</li> </ul>   | <ul style="list-style-type: none"> <li>Remove accumulations in digester deadspace</li> </ul>   | -                         | \$25,000                    |
|  | <ul style="list-style-type: none"> <li>Gas handling system upgrade               <ul style="list-style-type: none"> <li>a) New Plant (Digesters 1 and 2)</li> <li>b) Old Plant (Digesters 3 and 4)</li> </ul> </li> </ul>  | <ul style="list-style-type: none"> <li>Comply with current regulations</li> </ul>  | -                         | a) \$40,000<br>b) \$185,000 |

### 3.3 - 2 *Collingwood Harbour Modelling: Water Quality, Hydrodynamics, Harbour Exchange, Nutrient Budget*

In 1990, the Collingwood Harbour RAP engaged the services of consulting engineers Gore & Storrie Ltd. to construct a nutrient/hydrodynamic model for the harbour, co-ordinating available information about phosphorus and bacteria levels with data provided by special flow meters installed at several areas in the harbour and Nottawasaga Bay.

The Rand model was used to illustrate the flow of effluent from the sewage treatment plant and the three tributary streams that discharge to the harbour for September, October and November. As well, several RAP options for decreasing phosphorus levels in the harbour were examined using the model to predict their effectiveness. The model was used to predict the results of 10 options:

1. Move the STP outfall to the harbour mouth.
2. Move the STP outfall into Nottawasaga Bay.
3. Reduce the phosphorus concentration in STP effluent to 0.1 mg/L, with background P concentration of 0.002 mg/L in harbour.
4. Move the STP outfall to the southern edge of the turning basin, due north of the STP.
5. Reduce the phosphorus concentration in STP effluent to 0.2 mg/L, with background P concentration of 0.002 mg/L in harbour.
6. Install tertiary treatment at the STP (effluent P of 0.3 mg/L).
7. Reduce the phosphorus concentration in STP effluent to 0.3 mg/L, with background P concentration of 0.002 mg/L in harbour.
8. Open both an east and west gap in harbour to increase exchange with Nottawasaga Bay.
9. Open an east gap to increase exchange with bay.
10. Open a west gap to increase exchange with bay.

The options' relative effectiveness was evaluated in terms of the decrease in the area of water with levels of phosphorus exceeding the Provincial Water Quality Objective of 0.02 mg/L (Table 3.2, Figure 3.1).

Among its major findings, the model predicted that a phosphorus concentration of 0.01 mg/L in STP effluent would result in the provincial objective's being met, without moving the outfall. However, moving the STP outfall to deeper areas of the harbour or to outside the harbour would also produce the P concentration designated by the provincial objective, without changing the treatment process at the STP. An effluent phosphorus concentration of 0.02 mg/L would achieve the provincial objective in all but a small area near the present outfall; similarly, tertiary treatment providing effluent concentrations of 0.3 mg/L, without moving the outfall, would leave a greatly reduced zone of the harbour where the objectives are not achieved.

Opening an east or west gap would also result in a reduced area in which phosphorus concentrations exceed the provincial objectives, but an east gap was found to



be more effective than a west one). In addition, water conservation as an option was also modelled; a reduction in influent flow to the STP of 60 per cent was found to be required to reduce phosphorus loading to the level achieved by tertiary treatment, assuming P concentrations of 0.30 mg/L at current hydraulic loads.

The Gore & Storrie study also used an Excursion Exchange model to calculate the rate of water exchange between the harbour and Nottawasaga Bay occurring in the harbour's entrance gap. Average daily flow rates to the lake were found to be  $1.7 \times 10^6$  m<sup>3</sup>/day in September and October,  $2.6 \times 10^6$  m<sup>3</sup>/day in November (excursion distance: 200 m). Net exchange rates for the three months were  $0.3 \times 10^6$  m<sup>3</sup>/day,  $0.4 \times 10^6$  m<sup>3</sup>/day and  $1.2 \times 10^6$  m<sup>3</sup>/day, respectively. Residence times, the period during which water remains in the harbour on average, were found to be 1.8 days in September and 1.2 days in October and November. As well, hydrodynamic modelling showed that flow velocities within the harbour were much lower than those at the entrance gap in all months.

The exchange flows illustrated by the Rand Model were incorporated with another modelling system, Minns' Whole-Lake Phosphorus Model, to predict phosphorus levels in the harbour based on current phosphorus loadings for September, October and November. This generated precise estimates of phosphorus loadings from various sources (Figure 3.2). The steady-state model predicted a total allowable phosphorus loading of 3000 kg/year to achieve an overall phosphorus concentration of 0.019 mg/L in the harbour—a level that would meet the Provincial Water Quality Guideline for the prevention of nuisance algal growth. This led to the establishment of a maximum allowable annual P load from the STP. Remedial options that assist in meeting the RAP target load received high priority in the evaluation of preferred actions.

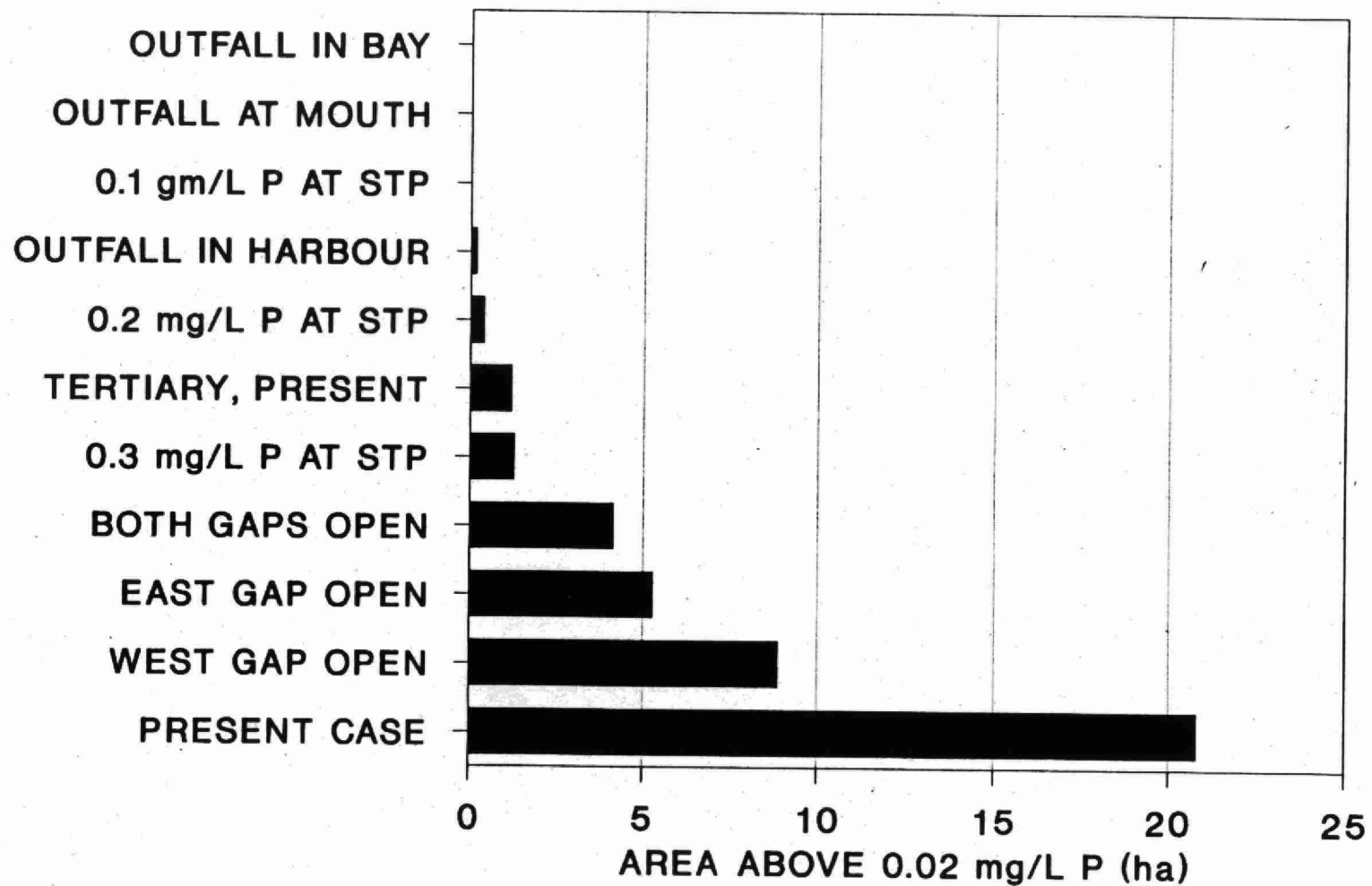
Based on the information available on P loadings from the tributaries during high flows, the load from the STP was assumed to account for 92 per cent of the total load to the harbour from harbour sources. To achieve the target of 0.019 mg/L of P in the harbour, at high STP flows of 20,000 m<sup>3</sup>/day, that translates into effluent P concentrations of 0.318 mg/L. At STP flows of 18,000 m<sup>3</sup>/day, effluent P concentrations would be 0.420 mg/L. Thus, it is P load rather than effluent concentration that drives the selection process for preferred remedial actions.

Table 3.2  
Rand Model Predictions, Effectiveness of 10 Options

| Option |               | September              |        | October                  |        | November               |        |
|--------|---------------|------------------------|--------|--------------------------|--------|------------------------|--------|
|        |               | Area (m <sup>2</sup> ) | Factor | Area (m <sup>2</sup> )   | Factor | Area (m <sup>2</sup> ) | Factor |
| 1      | Outfall #1    | 0                      | ±      | Simulation not performed |        |                        |        |
| 2      | Outfall #2    | 0                      | ±      | "                        |        |                        |        |
| 3      | 0.1 mg/L TP § | 0                      | ±      | "                        |        |                        |        |
| 4      | Outfall #3    | < 1,600                | > 130  | "                        |        |                        |        |
| 5      | 0.2 mg/L TP § | 4,000                  | 52.0   | "                        |        |                        |        |
| 6      | Tertiary †    | 12,000                 | 17.3   | "                        |        |                        |        |
| 7      | 0.3 mg/L TP § | 12,800                 | 16.2   | "                        |        |                        |        |
| 8      | Both Gaps     | 41,600                 | 5.0    | 44,800                   | 6.6    | 44,800                 | 8.5    |
| 9      | East Gap      | 52,800                 | 3.9    | 97,600                   | 3.0    | 28,800                 | 6.6    |
| 10     | West Gap      | 88,800                 | 2.3    | 212,800                  | 1.4    | 150,400                | 1.3    |
|        | Present Case  | 208,000                | 1      | 296,000                  | 1      | 190,400                | 1      |

NOTE:     †     Tertiary treatment with September background  
               ±     an area of zero represents an infinite improvement  
               §     STP TP level with 0.002 mg/L background in harbour

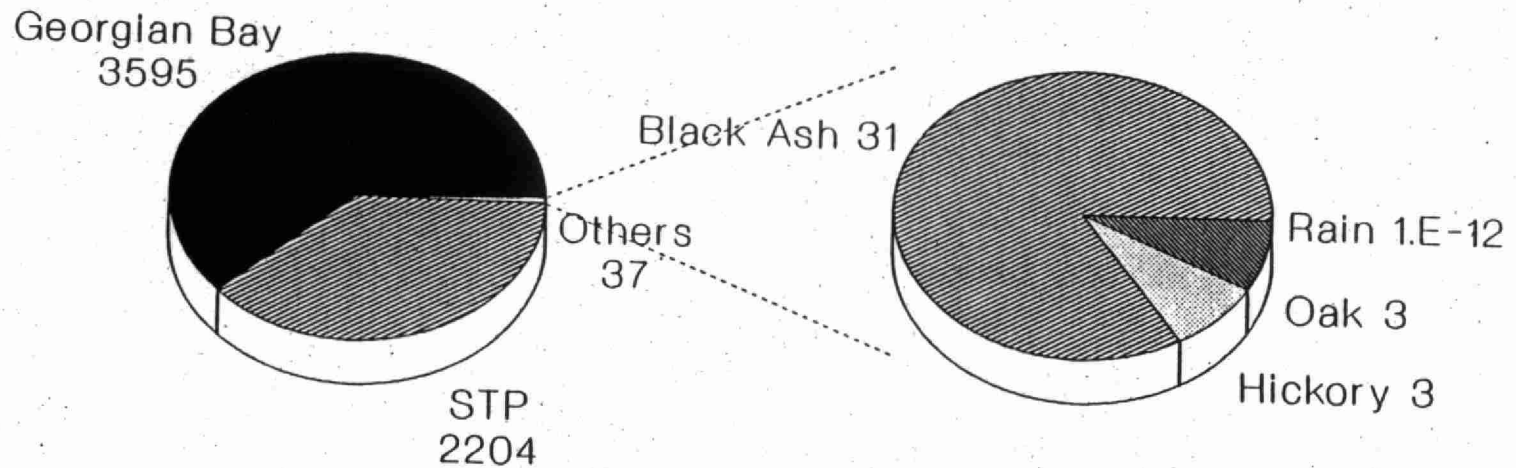
**Figure 3.1 Rand Model Predictions  
Effectiveness of 10 scenarios**



TERTIARY REFERS TO CURRENT BACKGROUND P CONCENTRATIONS

Figure 3.2

# Collingwood Harbour RAP Phosphorus Loads (kg/yr)



### 3.3 - 3 *Socioeconomic Profile of the Town of Collingwood*

In July, 1991, a report entitled *Socioeconomic Profile of the Town of Collingwood* was completed. The study had been commissioned by the RAP to illustrate the socioeconomic factors influencing Collingwood and its harbour and to evaluate remedial actions in light of current and projected socioeconomic conditions. The profile traces the history of Collingwood and its reliance on the harbour as a centre of industry, transportation and tourism. The economic development of the harbour created a strong economic base for the town, but also had a detrimental affect on the harbour's water quality. Today, the study finds, Collingwood is in a period of transition, brought about largely by the closing of Collingwood Shipyards in 1986 and the general decline of industry in the area since the late 1960s.

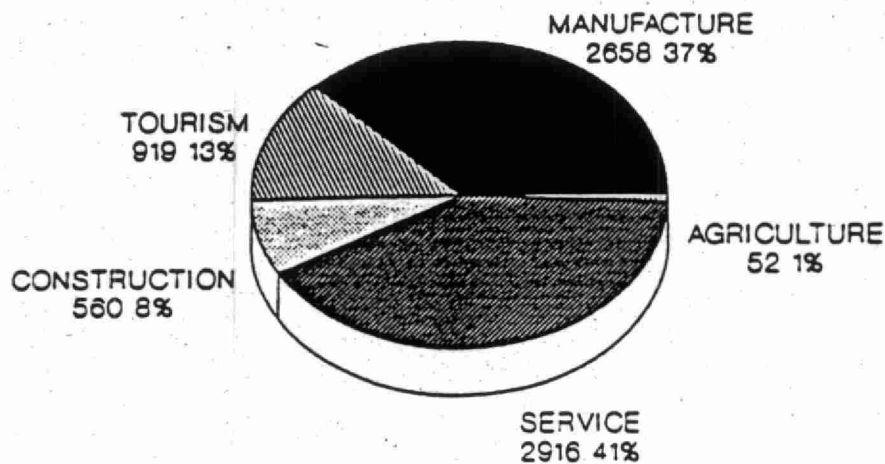
The socioeconomic profile describes how, of the several industries that historically relied on the harbour, shipbuilding was the most important. Indeed, the shipyards' significance for the town increased as road and direct rail linkages among southern Ontario's urban centres expanded, resulting in declining use of the harbour as a terminus for railways and Great Lakes ships. Shipbuilding, however, was not immune to the economic and historical pressures of the 20th century. The Depression and two world wars took their toll on the industry, and as it suffered so did the town. During the Second World War, the shipyards employed 2,000 people; after the war, the workforce was cut to 1,200. By the 1980s, the socioeconomic study notes, the shipbuilding industry was in a state of general decline. Contracts for construction had run out; few repair jobs were received because Collingwood was off the established shipping lanes. In 1986, Collingwood Shipyards closed its operation. Some 400 jobs--25 per cent of Collingwood's total manufacturing workforce--were lost.

In the 1960s, the town had established a wide-ranging industrial incentive program, and between 1966 and 1970 eight new industries came to the Collingwood area. When the surge of investment ended in the 1970s, several industries were well established and continued to provide employment. The socioeconomic profile notes, however, that throughout the 1980s industrial expansion in Collingwood virtually came to a halt. As an indicator of the general decline in the manufacturing sector in Collingwood, in 1982 manufacturing employed 2,820 people; by 1991, that number fell to 1,438--a loss of 49 per cent, according to the study.

While manufacturing declined in the past decade, tourism flourished. The socioeconomic profile estimates the number of boats now owned in the town at 1,400. Some 2,260 resident and 640 non-resident anglers fish in the area every year, contributing \$1 million to the local economy. Collingwood boasts 700 tourist accommodation rooms, 1,200 recreational condominiums, 600 marina slips, and other tourist facilities, most of them built in the past 10 or 15 years. In accordance with the area's increasing importance as a site for tourism, its seasonal population, now estimated at 4,000, has increased by 150 per cent since 1986. On the other hand, Collingwood's

Figure 3.3

### COLLINGWOOD EMPLOYMENT BY SECTOR (1988)



FROM KEIR CONSULTANTS INC. 1991

1988 permanent resident population of 12,200 represented a growth of only 1 per cent since 1981, compared with an increase of 32 per cent from 1969 to 1981. Population projections prepared by Marshall Macklin Managhan Limited using cohort survival methodology estimates a 7% growth in by 2001 and 13% growth by 2011. The study also notes that the population as a whole is aging: the 65-plus age-group already comprises 16 per cent of the population--52 per cent above the provincial average. Per capita income is below the average for Simcoe County and Ontario. The total workforce in 1988 numbered 7,100, with the service sector as the major employer, followed by manufacturing, tourism, construction and farming (Figure 3.3). Since 1988, however, manufacturing employment has dropped by 22 per cent. The socioeconomic profile predicts that that trend, along with an aging population and economic expansion in the service and tourism sectors, will likely continue.

Noting the socioeconomic factors of increased disposable income, more frequent vacations, an aging population and general fitness awareness, the study predicts a continuation of the residential/recreational boom that partially compensated for the loss of industry in the 1980s. Tourism, the study maintains, will be the major growth sector for the town's economy in the future, and that growth will result in changing uses for the harbour. Industrial uses will continue to decline, as transportation and shipbuilding activities are replaced by pleasure boating, fishing and other forms of passive recreation, along with an expansion of residential and recreational facilities near the harbour. Although industry will continue to play a role in the town economy,



the economic prosperity of Collingwood will increasingly depend on its ability to attract tourists. Improved water quality brought about by remedial action can enhance the economic benefits to the community of changing socioeconomic conditions.

With regard to future development of harbour-adjacent lands, the report discusses a proposal by Canada Steamship Lines to redevelop the old shipyards site in the southeastern corner of the harbour. In a comprehensive plan, CSL proposes to combine land and water uses with construction of canals and islands. Mixed residential units are planned, many of them designed for retired people. Marina facilities, a resort hotel, slips for transient boats and commercial development are additional possibilities for the CSL lands. Under the CSL proposal, the estimated cost of the project is over \$200 million--half of which, the study notes, will include contracts to the local construction industry.

According to the study, the predicted increase in on-shore residential/recreational development will put increased pressure on sewage treatment facilities (Table 3.3). As well, several mechanisms for funding remedial action are discussed. Among those are the implementation of user fees and licences for such water uses as water supply, commercial and sport fishing and recreational boating; a mechanism of limited discharge permits; effluent charges; and a special waterfront tax for harbour maintenance, applied to new waterfront developments. None of these mechanisms are presented as recommendations, but only as suggestions for discussion and consideration. The socioeconomic profile concludes that an "attractive, safe, usable harbour is one of Collingwood's most important 'tickets' to facilitate future prosperity."

**Table 3.3**  
**Potential Future Harbour Usage**

| Harbour Use         | Area of Use                                 | Magnitude of Use                  | Developmental Changes   | Implications for Remedial Actions                             |
|---------------------|---|-----------------------------------|---|---|
| Industrial          | Eastern spit                                | Light                             | None  | None. Does not contribute to nutrient loadings                |
| Commercial          | Southern shore                              | Intense                           | Marinas, hotel, resort  | Adds to STP loading, water consumption                        |
| Residential         | Eastern spit, southern shore                | Intense--medium- and high-density | Townhouse/apt. condos, recreational and social amenities        | Adds to STP loading, water consumption                        |
| Boating             | Throughout harbour                          | Moderate to intense               | Marinas, launches, parking                                      | May add to pollution; grey water                              |
| Fishing             | Shoreline, open water                       | Intense                           | Fishing piers and facilities                                    | Dependent on water quality                                    |
| Parkland            | Harbourview Park                            | Light to moderate                 | ENVIROPARK, links, improved facilities                          | RAP education centre  |
| Swimming            | Outside of harbour                          | Moderate to intense               | Beach, change-houses, parking                                   | RAP to ensure actions do not degrade water quality in the bay |
| Land-water linkages | Shore, water                                | Moderate to intense               | Shore and water access points, events                           | Increased use requires maintenance of water quality           |
| Municipal           | STP, harbour as receiving body for effluent | Intense                           | Improvements to STP, Town infrastructure and increased metering | Continuing source of loading to harbour to be controlled      |

Source: Keir Consultants Inc., 1991

### 3.3 - 4 *Town of Collingwood Waterfront Master Planning Report*

In May, 1990, the Town of Collingwood retained the team of M. M. Dillon Ltd., Natalie Scott Browne Architects and MIE Marine Engineers to undertake a waterfront-planning study. The findings of that team were published in the *Town of Collingwood Waterfront Master Planning Report* in March, 1991. The study's purpose was to take into account tourism, recreation, the natural environment and community planning to develop a master plan providing a range of year-round recreation opportunities, preservation and enhancement of natural features, and integrated planning of public- and private-sector lands.

In the report's proposed master plan, a design concept is forwarded to establish a comprehensive system of public space and identify the boundaries for encroachment on this space by public and private development. Taking into account the fact that, historically, First Street served as a boundary separating the waterfront and industrial harbour from the Town, the design concept focuses on the need to change the character of First Street to "integrate the waterfront lands into the urban fabric of Collingwood," and to reinforce the historical development of Collingwood with a strategy for occupying waterfront lands no longer used by industry. As well, the concept is intended to establish a public presence throughout the waterfront areas. Water-quality restoration, therefore, is vital for this plan to be effective.

In order to integrate the waterfront with the urban fabric of Collingwood, the report proposes the extension of intersections and gateways to the waterfront, allowing the existing parks--Harbourview and Sunset Point--to be more directly connected with the Town. The result would be an interlocking of parks, water and urban core. The study proposes that Collingwood's main street, Hurontario, be extended across First Street to end at a large public plaza on the waterfront, shifting the centre of the Town towards the water's edge. Similarly, First Street would be more fully integrated with the north-south shift in urban focus by becoming a "grand avenue"-style landscaped boulevard, making the street a threshold to the waterfront. The design concept also calls for increased public access to Harbourview Park (within the harbour boundary) and Sunset Point (east of the harbour) through central private land holdings, and addresses the development of privately owned lands by concentrating on the design of public open space. The concept also focuses on the need for new facilities to attract boating, sport fishing, recreation and tourism, in keeping with the shift away from heavy industry on the waterfront to marine-related industry.

Among its major specific proposals, the master plan recommends the enhancement of north-south streets intersecting First Street between Hickory and Birch Streets, in order to provide gateways to Harbourview Park, which forms the southwest border of the harbour area. In addition, the plan proposes enhancing the identification of public space in Harbourview Park through landscape treatment, involving extensive regrading, topsoil placement, resodding and planting, and the creation of an undulating topography. Upgrades of the municipal boat launch are also proposed, as is the construction of a pavilion, complete with washrooms and a fish cleaning/weighing station, at the terminus of Birch Street in the park. The plan calls for the construction

of public trails, one along the waterfront, one mid-park trail, and one that makes use of the abandoned rail corridor to link the Georgian Trail to the main intersection of Collingwood. Clearly, the harbour is seen as vital to the future of Collingwood.

The plan recommends that no further development of the STP take place at its current location. It also calls for extensive landscape buffering of the lands around the STP to make them more compatible with the public and private activities on adjacent lands.

In its recommendation that Hurontario Street be extended to the water's edge, the proposed master plan calls for the development of public space to integrate a retail/commercial main street along the west side of the central quay with the water. On CSL and CN properties where residential development has been suggested, a public presence would be established through the construction of streets and walkways, and an allowance for boulevards to provide service, lighting and trees. The overall design concept calls for all sidewalks and walkways constructed in new development to be consistent with the pattern of public streets.

With regard to the central pier, the plan recommends extension of a pedestrian trail along its east side and the installation of fishing piers. The central pier would also be the site of a public road to provide access to the Collingwood Terminals, the Collingwood Yacht Club, and to a public marina that the plan also proposes. That marina, to be located on the west side of the pier, would ultimately comprise 400 slips, with 246 slips for the yacht club and the remaining 154 for transient and local public use—a goal to be achieved over a 10-year period. The construction of marina facilities would demand the installation of fixed and floating breakwaters in the harbour outside the shipping lanes. As well, the plan recommends construction of a public parking lot on the central pier, capable of accommodating 400 cars. At the base of the pier, landfilling would create extra land for commercial and residential development. The plan recommends that special consideration be given to enhancing aquatic and wildlife habitat in the landfill activities, and it makes specific proposals about how this can be achieved. While the creation of habitat is consistent with the RAP, careful consideration of water-quality effects will be essential.

The master plan makes several proposals regarding development of the lands east of the harbour. Among those is the extension of public access along the waterfront and landscape improvements in Sunset Point Park. As well, the park would be developed as a site for active recreation, including such activities as boardsailing, swimming and fishing. The report goes on to provide an economic and financial analysis of its proposals, details on implementation and revisions required to current Town planning policies, as well as a discussion of relevant acts and policies.

The Collingwood Harbour RAP Team and the Public Advisory Committee are actively involved in Town of Collingwood planning activities. They are, therefore, fully aware of the areas in which the Town proposals overlap with the RAP mandate. The RAP Team and the PAC will continue to take an active role in co-ordinating the Town's redevelopment efforts with remedial actions undertaken by the RAP, to ensure that water

quality is preserved and that plans for improvement in environmental conditions in the harbour continue. The presence on PAC of individuals involved in community development assists in obtaining support for consensus positions from the municipality.



### 3.3 - 5 *Municipal Needs Study*

In 1990, F. J. Reinders and Associates (Barrie) Ltd. was retained by the Town of Collingwood to conduct a Sanitary Sewer Needs Study. The Town wished to determine the present condition and performance of the existing sanitary sewage collection system. The aim of the study was to develop the database needed to formulate a multi-year rehabilitation works program to correct deficiencies in the system, assess capacities and evaluate rehabilitation options.

The consultants completed an inventory of the sewage collection system, obtaining data on the system location, size, length, pipe materials, age, etc., for input into an MOE Sewage Inventory Management System (SIMS) software package. The inventory process was followed by surveys designed to establish the condition of the existing system using closed-circuit TV (CCTV) camera inspections, and smoke testing to investigate external rainfall connections in different catchbasins. The final step in the Needs Study was to evaluate the existing maintenance program in light of the data collected.

The study has also identified, for example, areas where rooftop downspouts are connected to the sanitary sewer system, which generates unnecessary flow volume during runoff conditions. Flat roofs are the primary source of illegal connections since stormwater roof drains typically descend through the interior of the building, and are connected to sanitary laterals. The Town currently has a program to disconnect these connections from the sanitary sewer.

The Needs Study has also identified private parking-lot catchbasin systems which have been connected to the sanitary sewer system. These catchbasins drain large impervious areas, and also contribute significant flow to the sanitary system during runoff conditions. It was recommended that the Town consider disconnecting these systems from the sanitary collection system.

The Town of Collingwood's sanitary sewer system was found to be in fair to poor structural condition. The flow monitoring program identified excessive inflow in all the catchment areas monitored. CCTV inspection identified several collapsed and badly cracked sections of pipe. The recommended rehabilitation program involves:

- Total reconstruction for all collapsed pipe sections
- Insituform (or equivalent) pipe liners for all cracked pipes (less labour-intensive, and road accessibility is maintained in most situations)
- Revision of sewer flushing from a four-year rotation to a two-year rotation to reduce the risk of blockages due to siltation

The cost of complete reconstruction for high-priority lengths of pipes was estimated at \$280,500, while the cost of repairing medium-priority locations was estimated at \$1,007,450.



#### **IV. PREFERRED REMEDIAL ACTIONS**

##### **A STRATEGY FOR RESTORING BENEFICIAL USES AND DELISTING COLLINGWOOD HARBOUR**

#### 4.1 EXPLANATION

The Collingwood Harbour RAP Team and the Public Advisory Committee have decided on seven remedial actions that are necessary for the delisting of Collingwood Harbour as an Area of Concern. Those seven options, which together form the basis of the delisting strategy summarized on the previous page, are judged by the RAP Team and the PAC as those that must be implemented first to achieve delisting. The options to be implemented for delisting, therefore, are to be considered as first priorities in the RAP process. They are discussed in detail in the following pages. The complete list of options proposed in the discussion paper appear in appendix III.

The Public Advisory Committee also recommended that other options should be included in this Stage 2 Report. These other options are divided into three categories: *Additional Options*, which are to be implemented or continued at the same time as the options to be implemented for delisting, but which are not considered to be essential to delisting; *Future Options*, the implementation of which depends on an evaluation of the effectiveness of the prior options; and *Rejected Options or Approaches*. As a result, the timetable for remedial action is:

- 1) Implement Options 5 and 27 first;
- 2) then implement Option 7;
- 3) then implement Option 6.
- 4) Continue Options 14, 10 and 11.
- 5) Proceed with Additional Options 13 and 26, 17 to 25, 28 and 29
- 6) Pending a review of the effectiveness of prior options, implement Future Options 1, 9, 3, or 8.

*There was 100-per-cent consensus for the above option priority.*

- 7) Reject options 2, 4, 12, 15 and 26

## 4.2 A DELISTING STRATEGY FOR COLLINGWOOD HARBOUR

### Summary

IJC's Beneficial Use  
That Needs To Be Restored

---

Restriction on Dredging Activities

---

Eutrophication or Undesirable Algae

and

Degradation of Aesthetics

---

Loss of Fish and Wildlife Habitat

---

### Remedial Action

---

**Implement OPTION 14:** Sediment removal and  
Confined Storage of Sediment

---

**Continue to implement OPTION 5:**  
Optimized Operations at  
the Existing STP, and  
**OPTION 27:** Water  
Conservation

**Implement OPTION 7:** Extend the  
Outfall with Diffuser  
into the Harbour\*

**Implement OPTION 6:**  
Incorporate New (Proven)  
Technology into the STP

---

**Review effectiveness of Options 5/27 and  
Option 7 and 6 within two years after Option 7  
has been implemented to determine need for  
either OPTION 1: Industrial Sewage Treatment  
Plant or OPTION 9: Pretreatment or OPTION 3:  
Tertiary Treatment or OPTION 8: New Technol-  
ogies for Industry**

---

**Maintain OPTION 10:** Wetlands  
Preservation

**And, when the opportunity arises, implement  
OPTION 11:** Habitat Rehabilitation

---

\* Option 7 is not a stand-alone option, and  
must be done in conjunction with Options 5, 27  
and 6.

#### **4.3 ADDITIONAL REMEDIAL ACTIONS TO BE INCLUDED IN THE COLLINGWOOD HARBOUR RAP**

*Combine* **Option 13: Vegetated Buffer Zone along Black Ash Creek and Canals**  
*with*

**Option 26: Agricultural Programs** (implementation begun Jan. 1992)

**Option 17: Environmental Playground** (under construction since May 1992)

**Option 18: RAP Communications Plan** (ongoing)

**Option 19: Environmental Library** (ongoing)

**Option 20: RAP Teaching/Information Package** (completed March 1992)

**Option 21: RAP Bulletin Board**

**Option 22: Mariner Education Package** (ongoing)

**Option 23: Information for Ice Fishermen**

**Option 24: Control Detergents**

**Option 25: Control Fertilizers**

**Option 28: Composting and Water-Conserving Toilets**

**Option 29: Restrict the Effects of Discharge of Grey Water from Boats**  
(ongoing)

#### 4.4 FORMAT

The seven options that have been decided upon as necessary for delisting are discussed in the following pages according to the following terms of reference.

**Proposal:** Summarizes the basic parameters of the proposed remedial action. For consistency, and to maintain the options as they were presented for public scrutiny, the wording is the same as that under the same heading in the corresponding options as described in *Making Choices: A Discussion Paper on Remedial Options*. Where the wording of the proposal has been altered, reasons for the alteration are described in **Discussion** below.

**Restoration of IJC Beneficial Use:** Lists the impaired IJC beneficial use(s) that the remedial option addresses.

**Objectives:** Describes the projected benefit of the options in terms of water-quality improvement. Again, the wording is the same as that in *Making Choices*.

**Description:** More detailed information on the option. Again, the description's wording is the same as that given in *Making Choices*.

**Related Projects:** Lists options that could be implemented at the same time as this option.

**Benefits:** Lists the projected water-quality and socioeconomic benefits of implementing the option.

**Probable Effectiveness:** Gives an estimate of the relative effectiveness of the option, on a scale of Low, Medium, High and Very High. In the case of options addressing nutrient loading to the harbour, cost effectiveness is expressed in terms of cost per square metre of harbour area restored. Currently, an estimated 20,800 m<sup>2</sup> of harbour area has phosphorus concentrations above 0.20 ug/L. The options addressing nutrient loading will restore varying proportions of that area. Therefore, the cost effectiveness of each option can be expressed in terms of cost per restored unit of area by the formula *Cost of Implementing Option (\$)/Total Area Restored (m<sup>2</sup>) = Cost per square metre (\$)*. For Option 14, Sediment Removal, a similar method to express cost effectiveness is used, except that total cost is divided by total volume restored (m<sup>3</sup>).

**Potential Obstacles to Implementation:** Lists difficulties that may arise during implementation, or problems that must be overcome before the option can be implemented.

**Cost:** Gives estimated cost of implementation.

**Funding:** Lists the parties and/or programs that will provide financing for implementation, and their share of the costs.

**Responsibility:** Lists the parties to be responsible for implementation.

**Discussion:** Summarizes the discussion of the options by the RAP Team and the Public Advisory Committee, and describes the process by which consensus was achieved.

**Status:** Describes the progress that has been made towards implementation of the option.



## **4.5 DESCRIPTION OF PREFERRED REMEDIAL ACTIONS**

### **IMPLEMENT OPTION 14: Sediment Removal and Confined Storage of Sediment**

#### **Proposal**

Dredging the harbour at large is not recommended since source control has been successful at restoring harbour sediment quality. It is, however, proposed that Collingwood Harbour be a demonstration site for removal technology under the sediment removal program funded by the federal Great Lakes Cleanup Fund. In the event that Canada Steamship Limited (CSL) agrees to participate in the demonstration, remove sediment from the CSL slips and other water lots, and have the sediment placed in confined storage concurrent with the demonstration project.

#### **Restoration of IJC Beneficial Use: Restrictions on Dredging Activities**

#### **Objectives**

Demonstrating removal technologies would provide some or all of the remaining sediment required to bring the confined disposal facility to capacity so that it may be capped. While currently isolated from the harbour turning basin, sediment from the shipyard water lots could be removed to prevent any possibility of contaminants from entering the harbour's waters from these sources. This would assist in protecting the harbour in the long term.

#### **Description**

The confined disposal storage facility is currently located at the harbour mouth near the grain elevators. The facility is not yet at 100-per-cent capacity, and there is still storage space available for approximately 10,000 m<sup>3</sup> of sediment. The Great Lakes Cleanup Fund sediment removal program could select Collingwood Harbour as a demonstration site for new removal technologies, and prompt the removal of the additional sediment in the shipyards property with the co-operation with Canada Steamship Lines. Whether or not the demonstration project is approved, the facility is slated to be filled in 1992.

**Related Projects:** None

#### **Benefits**

a) While concentrations of biologically available contaminants in the harbour's sediment

are not a cause of concern, levels of lead and zinc in the dry dock/launch basin areas are high enough to cause problems in the harbour, were dry dock/launch basin sediments to enter its waters. Removing this sediment to the confined disposal facility would eliminate that possibility.

b) Removal of contaminated sediment could deepen the navigational channel in the harbour.

c) The removal would help fill the confined disposal facility, allowing it to be capped.

d) Reducing the possibility of contaminated sediment in the dry dock area entering the harbour will enhance the stability of the harbour's benthic, plant, and fish and wildlife populations. The *Socioeconomic Profile of the Town of Collingwood* (see Section 3.1 - 2) notes that as industrial uses for the harbour continue to decline into the future, such tourism- and recreation-based activities as fishing, sightseeing and pleasure boating will become more significant economic and social factors in Collingwood. Fishing, for example, contributes over \$1 million annually to the local economy, and that contribution is likely to increase as recreational uses of the harbour are encouraged in the future. As well, the harbour redevelopment proposed in the town's *Master Planning Report* focuses on the social and economic importance of sport fishing and boating as means of benefiting from the trend away from industrial uses of the harbour to commercial/residential uses, diversifying Collingwood's economy by strengthening the local tourist industry, which already contributes approximately \$283 million annually to the local economy. Sediment quality can have a direct bearing on the viability of fish and wildlife populations, and the health of those populations is important to use of the harbour as a site for fishing, sightseeing and boating. While it may have short-term effects on angling in the harbour, in the long term removal of contaminated sediment to the confined disposal facility will contribute to these developments--and to their socioeconomic rewards--by helping to ensure that sediment contamination does not affect the harbour's flora and fauna.

**Probable Effectiveness:** Very High. Removing a volume of 4,000 to 9,000 m<sup>3</sup>, this option would cost an estimated \$83 to \$125 per cubic meter of sediment removed.

#### **Potential Obstacles to Implementation**

- a) Short-term disruption of benthos
- b) Short-term effects on angling
- c) Lack of participation by appropriate stakeholders

**Cost:** \$500,000 to \$750,000

#### **Funding**

It is proposed that Environment Canada would pay approximately \$350,000 through the Great Lakes Cleanup Fund. The remainder would be divided proportionally among other parties cooperating in implementation.

## **Responsibility for Implementation**

Canada Steamship Lines, possibly Transport Canada, Environment Canada, the Ontario Ministry of the Environment, Collingwood Terminals, the Town of Collingwood.

## **Discussion**

At the delisting strategy workshop, the group was brought up to date on efforts towards making Collingwood Harbour a test site for new technology in contaminated-sediment removal. Under a proposal made to Environment Canada by the Collingwood Sediment Removal Demonstration Project Team, Phase 1 of the project would involve pumping 1000 m<sup>3</sup> of soft material from the CSL launch basin and approximately 200 m<sup>3</sup> from the Collingwood Terminals pier wall into the confined disposal facility (CDF) adjacent to the Terminals. Since that discussion, the feasibility of removing material in close proximity to the terminal pier wall was brought into question and is currently acknowledged as having the potential to compromise the integrity of the terminal pier wall. This zone will not be included in the demonstration project.

In the second phase of the project, 3000 m<sup>3</sup> of material from the launch basin could be removed, depending upon co-operative efforts of project participants--this is beyond the mandate of the Cleanup Fund. Any additional sediment needed to fill the CDF would be dredged by Transport Canada from the east end of the harbour. Long term plans for the CDF will be determined by some of the members of the Sediment Removal Demonstration Team.

**There was 100-per-cent consensus on including Option 14 in the delisting strategy.**

## **Status**

The Collingwood Harbour Sediment Removal Demonstration Project Team first met in March, 1991, to explore the possibility of making Collingwood a test site for removal of contaminated sediment. Since then, Environment Canada has proposed four test areas for sediment removal under the Great Lakes Cleanup Fund; Collingwood Harbour is one of those areas. Discussions to establish the level of participation among the potential implementors is still ongoing. As a result, the start-up for the project, originally slated for October, 1991, has been delayed, and is tentatively scheduled for fall 1992. In addition, preliminary discussions with the U.S. Army Corps of Engineers have taken place about its participation in new technologies for capping the CDF.

## **CONTINUE OPTION 5: Optimize Operations at the Existing STP**

### **Proposal**

Replace manual control of portions of the STP operating systems with computerized control.

**IJC Impaired Uses Addressed:** Eutrophication or Undesirable Algae; Degradation of Aesthetics

### **Objectives**

Computerizing the control of processes such as aeration and phosphorus precipitation could enhance the cost and energy efficiency of sewage treatment at the STP, postponing or eliminating the need for further expansion of existing facilities.

### **Description<sup>2</sup>**

The STP process audit completed in November, 1991 provided a preliminary assessment of existing plant capacity and potential savings through computerization. A sensor-based automated control was recommended to control processes more efficiently than is possible through manual control. The project will address enhanced P removal by multi-point chemical (alum) addition, automated alum dosage control and raw and biological solids inventory control through computer-assisted operation at the existing STP. Automation of the chemical feed system to pace chemical addition rates to the P loading to the plant will be approached by the use of on-line P analyzers in conjunction with automatic pump control. Dual-point chemical addition will be investigated by implementing alum addition to the primary clarifiers in conjunction with the current practice of adding alum to the secondary portion of the plant (Fig 4.1).

If the success of these approaches can be demonstrated, it may be possible to avoid the cost of tertiary filtration at the plant. This cost has been estimated at about \$6.28 million.

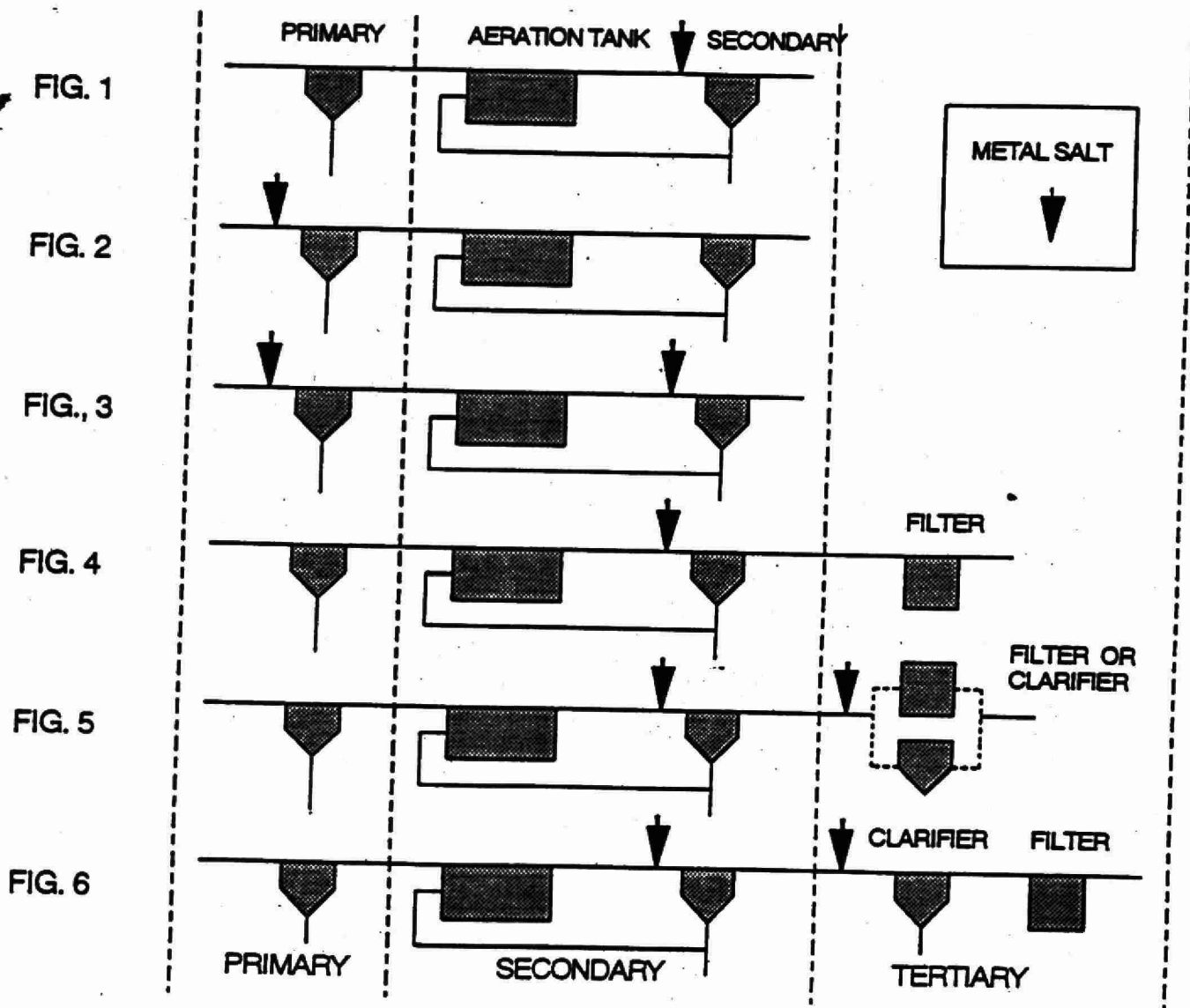
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<sup>2</sup>revised from discussion paper to reflect developments based on completion of STP process audit

Figure 4.1

## ALTERNATIVE PHOSPHORUS REMOVAL TECHNOLOGIES

- Fig. 1: Simultaneous Precipitation  
 Fig. 2: Pre-Precipitation  
 Fig. 3: Pre-Precipitation & Simultaneous Precipitation  
 Fig. 4: Simultaneous Precipitation & Filtration  
 Fig. 5: Simultaneous Precipitation, Post-Precipitation & Filtration  
 Fig. 6: Simultaneous Precipitation, Post-Precipitation, Clarification & Filtration.





**Related Projects:** Option 27, Water Conservation; Option 6, Incorporate New (Proven) Technologies into the STP

### **Benefits**

- a) Optimization could reduce phosphorus in STP effluent to 0.3 mg/L consistently, which should result in P concentrations in the harbour of less than 0.020 mg/L at current high and average flows.
- b) Will reduce energy consumption at the STP.
- c) Could help eliminate phosphorus peaks that occasionally occur at the STP and have adverse effects on water quality.
- d) Optimizing STP operations may result in overall phosphorus concentrations in the harbour of less than 0.020 mg/L, the Provincial Water Quality Objective P concentration for prevention of nuisance algal growth. Preventing nuisance algal growth should enhance uses of the harbour that may be impaired by its presence. Among those uses are fishing, boating and sightseeing. Maintaining and enhancing such uses will be of central socioeconomic benefit in the future. As noted in the *Socioeconomic Profile of the Town of Collingwood*, industrial uses for the harbour have been gradually replaced by residential/commercial and recreational uses, and that trend is likely to continue. As tourism, fishing and sightseeing contribute more to the social and economic livelihood of Collingwood, the prevention of nuisance algal growth will take on even more vital importance. As well, the Town is currently considering a proposal laid out in its *Master Planning Report* to redevelop the waterfront to enhance the harbour's presence in the community and take advantage of its economic potential as a site for tourism and recreation (see Section 3.1 - 2). The plan estimates that redevelopment will attract increased numbers of same-day visitors, overnight visitors and recreational boaters—annually contributing \$300,000-\$500,000, \$4 to \$6 million, and \$300,000-\$875,000, respectively, to the local economy. For that redevelopment to be successful, the maintenance and enhancement of fishing, boating, sightseeing and other uses that may be impaired by nuisance algal growth must be ensured, since the harbour will play a central role in the new Collingwood envisaged by the plan.

**Probable Effectiveness:** High. By restoring an estimated harbour area of 208,000 m<sup>2</sup> to P concentrations of 0.020 mg/L or below (Fig. 4.2), it would have a cost effectiveness of \$2.40 per square metre.

### **Potential Obstacles to Implementation**

none: implementation underway as of July 1992

**Cost:** \$444,000 (Source: CH2M HILL.)



## **Funding**

Costs of optimization to be shared by the Town of Collingwood and the Ontario Ministry of the Environment, with additional support from Environment Canada in support of innovative approaches to achieving high quality effluent from secondary treatment plants.

## **Responsibility for Implementation**

Town of Collingwood

## **Discussion**

At the delisting strategy workshop, it was recommended that the wording of this option be amended from "Computerize Operations at the STP," the title of the option in *Making Choices*, to "Optimize Operations at the STP." The amendment takes into account that improvements at the sewage treatment plant could have both technological and human components.

The results of the *Collingwood Harbour Modelling* (see Section 3.1 - 2) indicated that a phosphorus concentration of 0.378 mg/L in STP effluent would be necessary to achieve P levels of 0.019 mg/L throughout the harbour during periods of high flow (20,000 m<sup>3</sup>) to the sewage treatment plant—below the Provincial Water Quality Objective of 0.020 mg/L P concentration for the prevention of nuisance algal growth; during periods of lesser flow (18,000 m<sup>3</sup>), the required effluent P concentrations would be 0.420 mg/L (Figure 3.4). The *Process Audit of the Collingwood STP* found that achieving those effluent P concentrations may be possible through alum addition pump control and dual-point chemical addition, along with other process improvements that may be implemented under this option.

During discussion at the delisting strategy workshop, it was advanced that this option by itself could restore water quality and beneficial uses under normal conditions. It was also noted, however, that future development in the Town will probably lead to increased flows to the STP that may lead to the phosphorus loading limit set by the RAP being exceeded. As well, population projections beyond the year 2001 are indefinite, and the process audit results and harbour modelling must be considered in light of the limitations of the currently available data. The cost of servicing future developments would, in part, be offset by lot levies, but additional actions are still necessary for delisting.

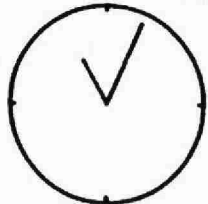
**There was 100-per-cent consensus on including OPTION 5: OPTIMIZE OPERATIONS AT THE STP, in the delisting strategy.**

**Status:** Discussions were initiated in January 1992, with the Town of Collingwood, MISA Municipality section of MOE and the Wastewater Technology Centre in Burlington, Ontario. A proposal has been prepared which includes a project to test two approaches to optimize the phosphorus removal system at the Collingwood STP. It

includes an examination of the effectiveness of on-line phosphorus analyzers in conjunction with automatic pump control to pace chemical addition rates, and an investigation of dual-point chemical addition on STP operation and effluent quality. It is currently anticipated that the project will be initiated in July 1992.

Figure 4.2 PLUME DIAGRAM ILLUSTRATING WATER QUALITY RESULTS OF  
REDUCING STP EFFLUENT P CONCENTRATION TO 0.30 MG/L, AS MODELLED.

SEP 22 15001 STEPS



PM

# COLLINGWOOD HARBOUR

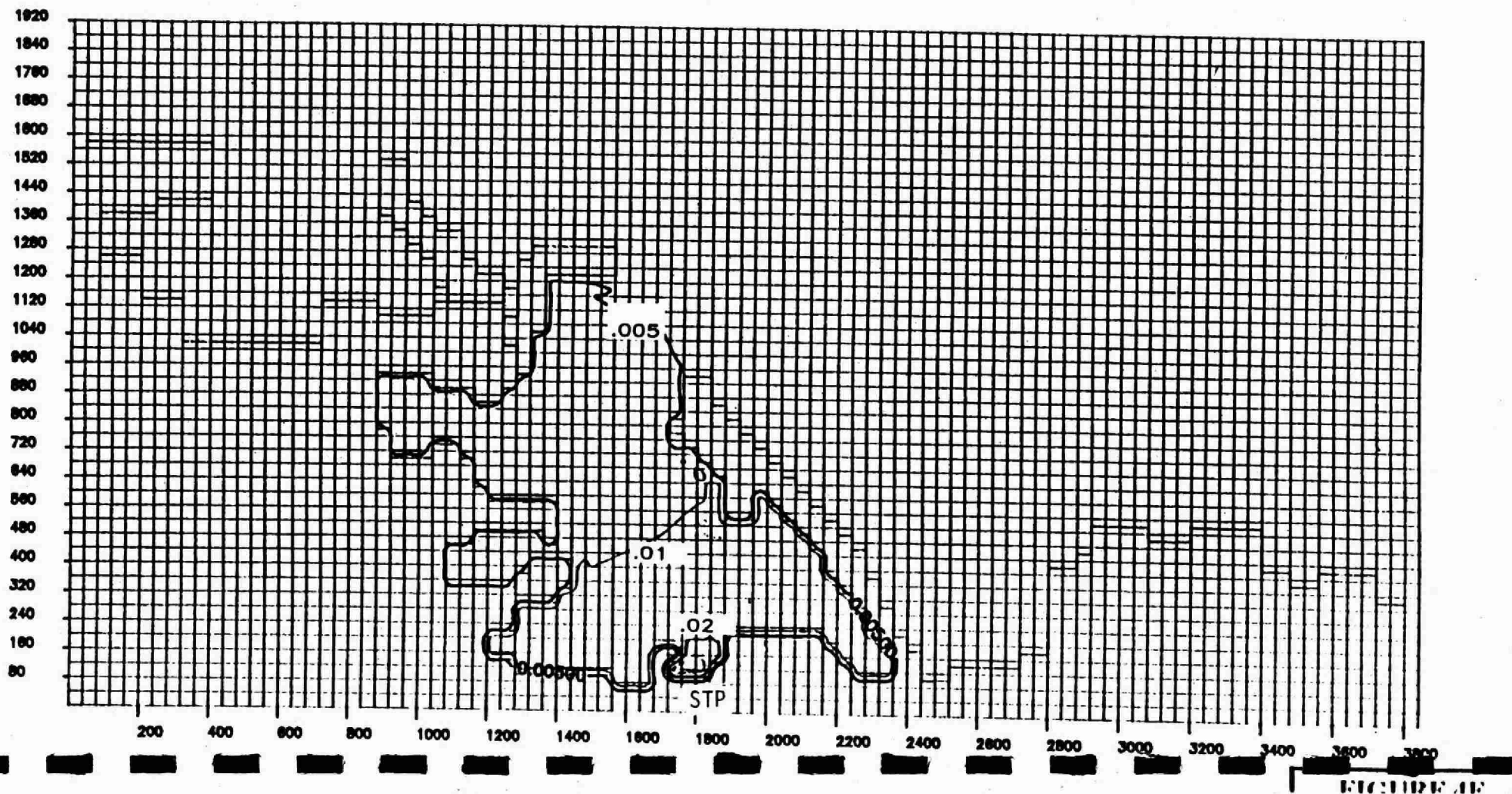
TERTIARY TREATMENT  
TOTAL PHOSPHORUS

WIND  
1.4 M/S



400m  
GRID SCALE  
CONTOUR LEVELS

0.00500  
0.01000  
0.0200  
0.0300  
0.0400



## **CONTINUE TO IMPLEMENT OPTION 27: Water Conservation**

### **Proposal**

Encourage reductions in water consumption, particularly in light of the new water-metering system, water rate increase and proposed Town sewer-use surcharge.

**IJC Impaired Uses Addressed:** Eutrophication or Undesirable Algae; Degradation of Aesthetics

### **Objectives**

Reducing water consumption would cut down on the volume of waste water treated by the sewage treatment plant. As a result, the probability of a plant process upset due to hydraulic overload would be reduced. In addition, reduced water consumption would mean that the local public utility would not have to treat as much water to send to households and commercial and industrial institutions, resulting in less expensive overall water treatment and leaving room for further expansion of services.

### **Description**

There are two primary incentives to reduce water consumption, one economic and the other environmental. The economic incentive would consist of an increase in the unit cost of water, making use of the Town's new water-metering system. Applying the user pay principle to water surcharges would encourage water conservation initiatives by residential, commercial and industrial users. The second incentive already in place involves a public education program to encourage the use in the household of such items as water-saving shower heads and toilet dams. The education program concentrates on the benefits of reduced water consumption to both the environment and the domestic budget, and could be expanded through the RAP to local radio or television ads, newspapers or door-to-door flyers. Process changes at industry that result in water conservation and reuse could significantly decrease water consumption and hydraulic load to the STP.

**Related Projects:** Option 5, Optimize Operations at the STP

### **Benefits**

- a) Reduced water use can reduce total phosphorus loading to the harbour and assist the STP in meeting the RAP P loading target of 2760 kg/yr.
- b) Lighter loading on the STP should increase its efficiency and delay expansion .
- c) Installation of energy-efficient shower heads and toilet tank inserts could save approximately \$100 per household in the area in energy costs, at least \$25 in water

costs, with savings to the Town water costs of as much as \$10,000 per year. This latter figure will increase dramatically when the cost of water filtration is introduced into the equation.

d) Implementation of water-conservation options would be relatively inexpensive and unit-cost increases could result in more revenues for the public utilities to be directed into capital works.

e) Reduced energy consumption for hot water heating translates into less fossil fuel consumption and a reduction in atmospheric pollution.

f) By contributing to reductions in phosphorus loading to the harbour, water conservation will help eliminate nuisance algal growth and will enhance water clarity and the general aesthetics of the harbour. Maintaining and restoring these uses through water conservation may enhance the harbour's position as a centre of socioeconomic activity for the town, especially as industrial uses decline and tourism, recreation and commercial/residential development become more important. As well, improvements in aesthetics will enhance the effectiveness of the reorientation of Collingwood around its harbour as outlined in the Town's *Master Planning Report* (see Section 3.1 - 2).

g) Implementation of educational and incentive programs for water conservation should foster among citizens a sense of involvement in issues of water quality, helping to ensure that co-operation and participation in restoring and preserving Collingwood Harbour is of vital interest to the community as a whole.

**Probable Effectiveness: Medium**

#### **Potential Obstacles to Implementation**

a) The implementation of water-conservation measures will require extensive public co-operation.

b) There may be resistance to the initiation of a sewer-use surcharge, which could be overcome by providing cost-saving incentives to minimal users.

**Cost:** Depends on water-conservation measure implemented; may result in cost savings to the Town. Installation of residential water metering system resulted in an expenditure of \$800,000 from 1987-1990. Cost to larger industrial water users for implementing process changes could range from \$50,000 - \$100,000.

#### **Funding**

Levels of funding depend on specific measures. Grants for pollution prevention incentives potentially available from Ontario Ministry of the Environment, Environment Canada, and Ontario Hydro.



## **Responsibility for Implementation**

The entire community of Collingwood will be responsible for water conservation, including residential, commercial and industrial water users.

## **Discussion**

The *Collingwood Harbour Modelling* study provided a measure of the effectiveness of water conservation programs in reducing phosphorus loading to the harbour. It was found that a reduction of 60 per cent in influent flow to the STP would be necessary to reduce P loading to the harbour equivalent to tertiary treatment (see Section 3.1 - 2).

This option is already being implemented by the community's increasing use of water-conserving shower heads and toilet dams, and by industry's efforts at reducing water use. In support of the option, it was also noted that reducing hydraulic flow to the STP reduces the mass of pollutants entering the harbour, and that an ascending water rate schedule should be considered during implementation. It was advanced that the option should include an educational component, in keeping with the philosophy that education, rather than punitive measures, should be stressed during implementation. In other words, encouraging water conservation should take the form of a bonus for those who conserve.

**There was 100-per-cent consensus on including Option 27: WATER CONSERVATION (WITH AN EDUCATIONAL COMPONENT) in the delisting strategy.**

**Status:** The Town of Collingwood has a well-developed water conservation program in place. The conservation initiatives are being spearheaded by the Collingwood Public Utilities Commission in cooperation with the town. The PUC has also involved the local public school system, by implementing a program through the schoolchildren to have toilet tank inserts installed in their parents' homes. Over half of the households, as well as the hotels serviced by the PUC have water-conserving shower heads and toilet dams. Service charges are based on a cost recovery system and the PUC regularly monitors for leaks when customer service charges appear to be excessive.

The PUC is also considering seasonal charges on residential water users to encourage a reduction in the peak water use experience during the summer months. While residential water use averages 22 million gallons per month, average use increases in the lawnwatering months of June, July and August to 36 million. The PUC has estimated that the average person uses 333 litres per day, which increases to 666 litres per day in the lawn watering months. Therefore, seasonal charges could make good use of the water meters installed during 1987-1990. Approximately 5300 water meters were installed for residential and commercial users at an approximate cost of \$800,000 over a period of four years.



The town is currently working with the three largest industrial water users to encourage process changes that will result in substantial reductions in water use. Employing the user-pay principle, there is a shift away from mill rates to surcharges based on water use. As well, the impending sewer charges has prompted the three largest water users, L.O.F. Glass, Canadian Mist Distillers and Nacan Products to look at changes in their use of water, which potentially could reduce the discharge to the sanitary sewer system by 40%. An example of the potential for change is exhibited by a project which would cost approximately \$60,000 to reduce water use by 3 million gallons per month. The cost recovery period for this would be less than one year, without incorporating the cost savings if a sewer charge based on water use is implemented. The intention is to transfer the ideas generated by these industries to smaller industrial water users serviced by the PUC. The figure below demonstrates the decrease in water supply to the Town as a consequence of the PUC water conservation program.

## **OPTION 7: Extend the Outfall with Diffuser into the Harbour**

### **Proposal<sup>3</sup>**

Relocate the current STP outfall further into the harbour and install a diffuser to more rapidly dilute the effluent and to speed up the rate at which the effluent is mixed with harbour waters, in an area away from stagnant embayments.

**IJC Impaired Uses Addressed:** Eutrophication or Undesirable Algae; Degradation of Aesthetics

### **Objectives**

Extending the outfall further into the harbour with a diffuser would enhance the rate at which STP effluent is diluted and assimilated.

### **Description**

The existing outfall for STP effluent is located essentially at shore, in a small, sheltered embayment behind the breakwater in the southeast corner of the harbour. This option proposes to extend the existing outfall piping to an area within the harbour where the flow of water is conducive to rapid assimilation of phosphorus, and where impacts on Nottawasaga Bay are insignificant.

**Related Projects:** Extending the outfall is not a stand-alone option, but must be implemented in conjunction with Options 5, 27 and 6.

### **Benefits**

- a) Nutrients would be dispersed more efficiently, in an areas away from sheltered embayments resulting in the harbour's waters meeting provincial water-quality guidelines, or better.
- b) Will conform better to the Ontario Ministry of the Environment's requirements for STP outfall design.
- c) By reducing total phosphorus concentrations in the harbour, and thereby contributing to the elimination of nuisance algal growth and improving water clarity, this option should result in many of the same socioeconomic benefits as the nutrient reduction programs outlined above. Enhancing the harbour's aesthetics, and therefore its

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<sup>3</sup>rephrased from "Making Choices"

usefulness as a sight for recreational activities and commercial/residential development, will contribute to the economic and social activities centring around the harbour, which will take on an increasingly important role in the day-to-day life of the community.

**Probable Effectiveness:** Very high. By restoring 206,400 m<sup>2</sup> of harbour area to P concentrations below 0.020 mg/L, relocating the STP outfall within the harbour has a cost effectiveness of \$9.69 per m<sup>2</sup>.

### **Potential Obstacles to Implementation**

a) Increasing dispersal of nutrients at the outfall for STP effluent may meet with public objection to "dilution" as a solution.

**Cost:** \$2,123,000

### **Funding**

The cost of extending the outfall with a diffuser would be borne by the Town of Collingwood and, possibly, the Ontario Ministry of the Environment.

### **Responsibility for Implementation**

The Town of Collingwood.

### **Discussion**

The addition of the phrase "with diffuser" in *Making Choices*' description of the option was decided upon at the delisting strategy workshop.

Discussion at the delisting strategy workshop centred on the role of Option 7 as a "dilution solution." In the discussions with the PAC, there was opposition to extending the outfall as a stand-alone approach; the group agreed that implementation must occur in conjunction with other initiatives, specifically Options 5, 27 and 6. In support of the option, it was noted that extending the outfall will be effective in restoring water quality, and would provide receiving water improvements equal to building a new sewage treatment plant, but at less cost. The modelling results (see Figures 4.3-4.5) showed that at three possible new outfall locations--the harbour mouth, Nottawasaga Bay and the southern edge of the turning basin due north of the STP--the effects of harbour bacterial and phosphorus levels on Nottawasaga Bay would be reduced, and overall P concentration below 0.020 mg/L would be achieved. As well, the STP outfall may have to be moved if plans to build a harbour marina and to reconfigure the public launch are realized. It was also noted, however, that efforts to reduce phosphorus

loading to the harbour should not be reduced simply because the outfall will be farther offshore, and it was agreed that the primary focus should continue to be on establishing phosphorus-loading goals rather than flow-concentration goals.

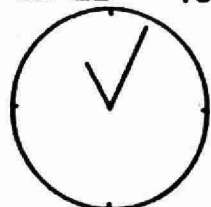
Semi-weekly, weekly, and bi-weekly analyses of the STP effluent from 1989 to 1991 showed that persistent toxic contaminants including PCB, DDT, DDD, pesticides and PAHs were all below detection limits. Extending the outfall within the harbour would not disperse persistent toxic contaminants into the open harbour waters. Consultation with Approval & Planning of Environment Ontario's Central Region confirmed that this proposal would constitute an improvement to the current configuration of the STP outfall.

Implementation of Option 5, Optimize Operations at the STP, should be begun before the outfall is extended. Furthermore, the group recognized the need for monitoring the effects of this option in Stage 2 of the RAP.

**There was 100-per-cent consensus to include OPTION 7: EXTEND THE OUT-FALL WITH DIFFUSER INTO THE HARBOUR, in the delisting strategy.**

Figure 4.3 PLUME DIAGRAM FROM HARBBOUR MODELLING SHOWING RESULTS  
OF MOVING OUTFALL TO HARBOUR MOUTH

SEP 22 15001 STEPS



PM

Gore & Storrie Limited

# COLLINGWOOD HARBOUR

NEW OUTFALL LOCATION #1  
TOTAL PHOSPHORUS

WIND  
1.4 M/S



500 M  
GRID SCALE

CONTOUR LEVELS

0.00500  
0.01000  
0.0200  
0.0300  
0.0400

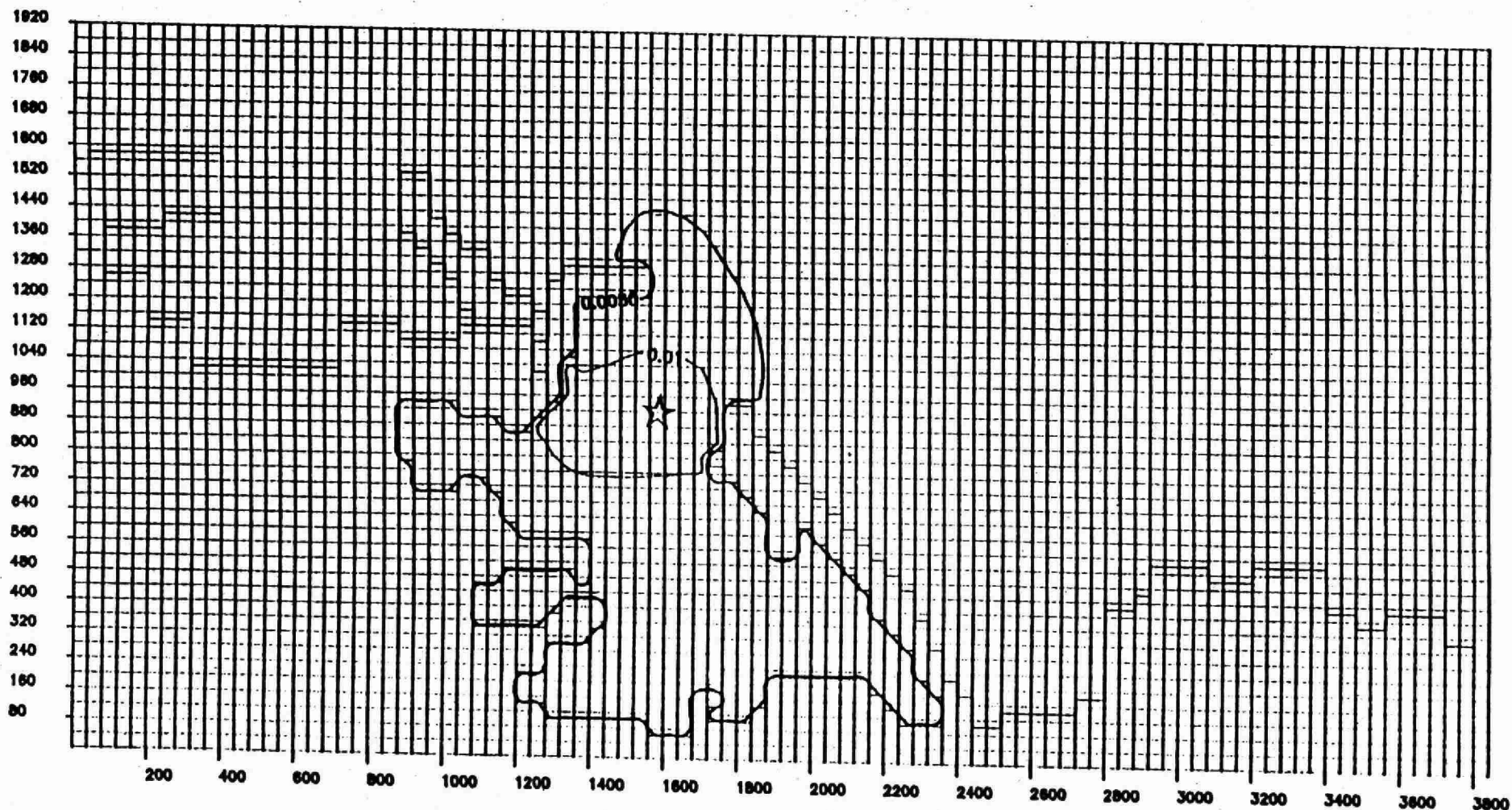
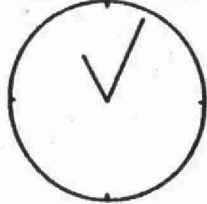




Figure 4.4 PLUME DIAGRAM FROM HARBOUR MODELLING SHOWING RESULTS  
OF MOVING OUTFALL TO BAY

SEP 22 15001 STEPS



PM

# COLLINGWOOD HARBOUR

SECOND ALTERNATIVE OUTFALL LOCATION  
TOTAL PHOSPHORUS

WIND  
1.4 M/S



500 m  
GRID SCALE

CONTOUR LEVELS

0.00500  
0.01000  
0.0200  
0.0300  
0.0400

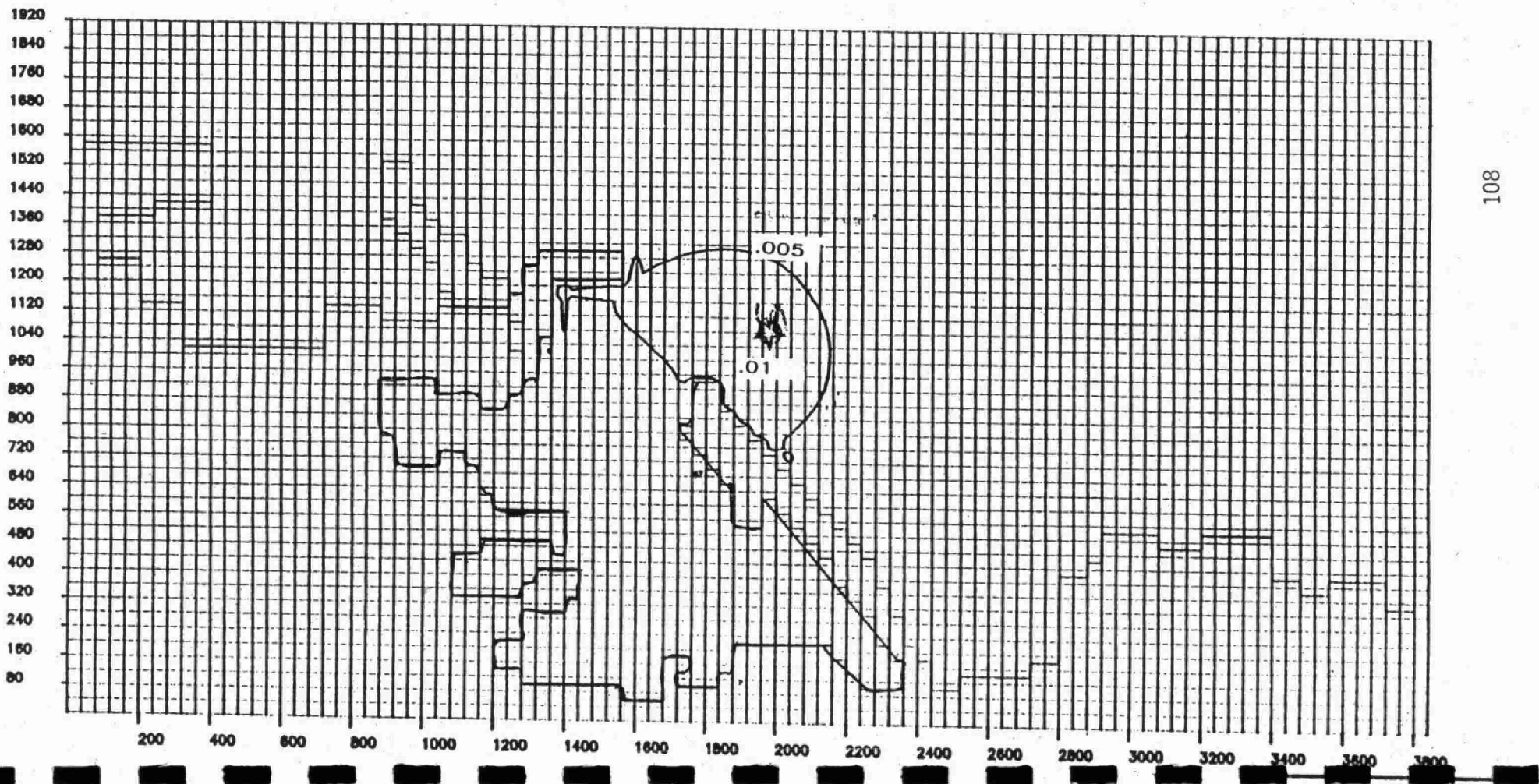
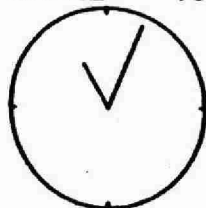




Figure 4.5 PLUM DIAGRAM FROM HARBOUR MODELLING SHOWING RESULTS OF  
MOVING OUTFALL TO SOUTHERN EDGE OF TURNING BASIN.

SEP 22 15001 STEPS



PM

Gore & Storrie Limited

# COLLINGWOOD HARBOUR

OUTFALL LOCATION #3  
TOTAL PHOSPHORUS

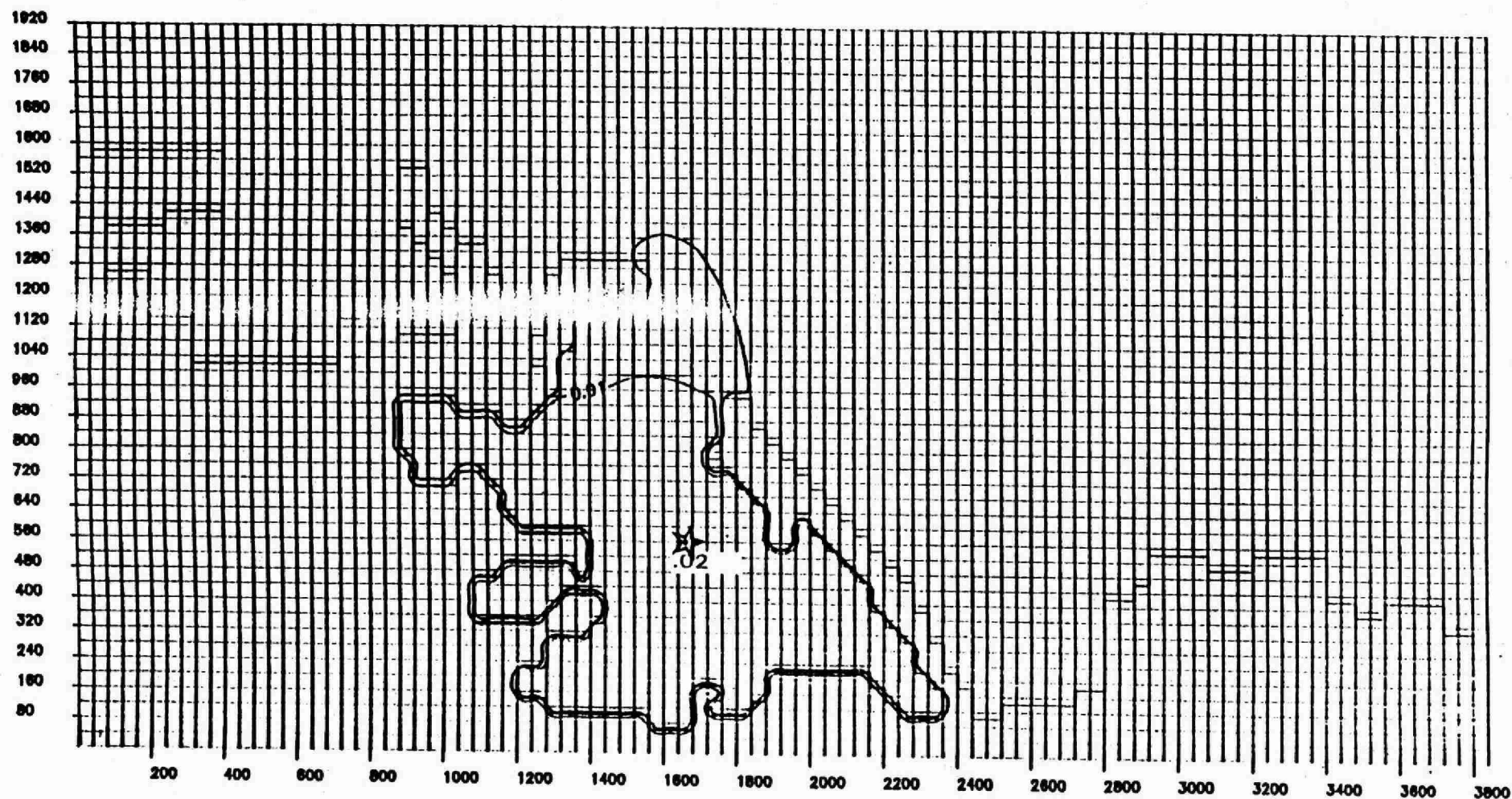
WIND  
1.4 M/S



400m  
GRID SCALE

CONTOUR LEVELS

0.00500  
0.01000  
0.0200  
0.0300  
0.0400



## **OPTION 6: Incorporate New (Proven) Technology into the STP (revised)**

### **Proposal**

Apply new technologies, such as solar aquatics and process changes, on a large scale once they are proven to be effective.

**IJC Impaired Uses Addressed:** Eutrophication or Undesirable Algae; Degradation of Aesthetics

### **Objectives**

New technologies could enhance the efficiency of the sewage treatment plant and thereby reduce the amount of phosphorus and other contaminants entering the harbour's waters.

### **Description**

New technologies for effluent polishing are to be investigated as they emerge. Among the possible new technologies are the following:

**Manmade Marsh/Constructed Wetlands:** In this system, waste water is given preliminary treatment by a conventional treatment plant that screens out solids. Then, oxidation ponds receive the waste water and algae remove more solids. From the oxidation ponds, the partially treated waste water is pumped into a manmade marsh, where micro-organisms that live in the roots of marsh and aquatic plants remove not only the remainder of human waste, but also, in some cases, toxic metals and trace organics.

#### Advantages

- a) Constructed wetlands are relatively inexpensive.
- b) They produce no sludge.
- c) They are effective in removing nitrogen and toxic chemicals.
- d) A marsh can survive toxic overload better than a conventional STP can.
- e) A marsh does not use chemicals to produce the same or better results as a secondary conventional plant.
- f) A way of using waste to develop wetlands habitat.
- g) Constructed wetland sewage treatment is particularly well suited to small communities with lots of land.

#### Disadvantages

- a) Constructed wetlands require extensive tracts of land.
- b) Plants need to be harvested from time to time.
- c) Their effectiveness is highly questionable in winter months.

**Solar Aquatics:** Solar aquatics is a non-chemical method of waste-water treatment, because it re-creates the purifying effects of a functioning ecosystem. First, sewage flows into an algae compartment, where bacteria break down wastes. Duckweed and algae remove the products of the bacterial digestion, while zooplankton and snails consume the algae. Effluent enters another artificial ecosystem where marsh and aquatic plants remove nitrates, heavy metals and toxic chemicals. The system can be very efficient, resulting in water that, with the exception of viruses, has been almost entirely purified. And the ecosystems that form the basis of solar aquatics can also be used to produce valuable fish and plant populations.

#### Advantages

- a) Solar aquatics does not produce as much sludge as a conventional STP does.
- b) The system requires less land than marsh-based systems.
- c) Over the long term, solar aquatics may be less expensive than conventional STPs.
- d) The system can treat highly concentrated sewage.
- e) Solar aquatic systems sustain fish and plant populations.

#### Disadvantages

- a) The technology for solar aquatics has not been as extensively tested as that of other alternative technologies.
- b) Maintaining a solar aquatics system requires specially trained personnel.
- c) Initial cost of facilities could be high, and they need to be heated in winter.

**Related Projects:** None

#### **Benefit**

Increased efficiency of STP operation will reduce phosphorus loading to the harbour, resulting in the same social and economic benefits as those associated with other options aimed at reduction in nutrient loading.

**Probable Effectiveness:** High

**Possible Obstacles to Implementation**

- a) Contingent upon development of new technology.
- b) Existing new technologies may not be effective in a north-temperate climate.

**Cost:** Dependent on specific project, constructed wetland capital cost \$500-1000/m<sup>3</sup>•d, operating and maintainance costs 0.03-0.09/m<sup>3</sup> (exclusive of land acquisition costs) (WPCF 1990)

### **Funding**

Funding could be shared by the Town of Collingwood, the Ontario Ministry of the Environment, Environment Canada and local business and industry.

**Responsibility for Implementation:** Dependent on specific project. If used for effluent polishing at the STP, the Municipality would be responsible for implementation.

### **Discussion**

The wording of this option was amended at the delisting strategy from that in *Making Choices* ("Develop New Innovative Technology for the STP") to "Incorporate New (Proven) Technology into the STP." The group agreed that only proven technologies should be used at the sewage treatment plant.

**There was 100-per-cent consensus on including the revised OPTION 6: INCORPORATE NEW (PROVEN) TECHNOLOGY INTO THE STP, in the delisting strategy.**

## **MAINTAIN OPTION 10: Wetlands Preservation**

### **Proposal**

In co-operation with the Town of Collingwood, maintain the prevention of further destruction of wetlands and/or developmental invasion of wetlands.

**IJC Impaired Uses Addressed:** Loss of Fish and Wildlife Habitat

### **Objectives**

The preservation of wetlands contributes to sustaining fish and wildlife populations within the harbour area, which is one of the Public Advisory Committee's goals. Preserved wetlands also ensure that the harbour can continue to be used as a recreational area for fishing and nature observation.

### **Description**

The only wetland to which this option applies is located at the southwest end of the harbour. At present, the area is designated as a provincially significant Class 2 Wetland. As well, the Town of Collingwood has zoned the wetlands as environmentally protected areas. The remedial action here calls for the recognition in the Town's Official Plan to preserve wetland areas. Actively, the RAP, in conjunction with the Town, will monitor plans for future development in the area and involve the Ontario Ministry of Natural Resources (MNR) and the federal Department of Fisheries and Oceans (DFO) in any future plans that would adversely affect the harbour's wetlands environment.

**Related Projects:** Option 11, Habitat Rehabilitation

### **Benefits**

- a) A program of wetlands preservation ensures that fish and wildlife populations in the harbour area are sustained—one of the designated goals for Collingwood Harbour.
- b) Preserves existing harbour wetland areas.
- c) By helping to maintain a healthy fish population in the harbour, wetlands preservation will contribute to the continuation of sport fishing in Collingwood—an activity that, according to the *Socioeconomic Profile of the Town of Collingwood* (see Section 3.1 - 2), already contributes over \$1 million a year to the local economy.
- d) As commercial/residential redevelopment of the waterfront takes place in the future, the continuing health of fish and wildlife habitat will become more important as an

attraction for tourists, residents and community activity. The reintegration of Town and waterfront as proposed in the *Master Planning Report* will depend partly on the maintenance and preservation of existing wetland for sightseeing, nature observation and the general aesthetics of the harbour and Collingwood.

**Probable Effectiveness:** Medium

#### **Potential Obstacles to Implementation**

- a) May constrain development.
- b) Difficulty in enforcement of MNR and DFO policies.

**Cost:** None.

**Funding:** Not relevant.

#### **Responsibility for Implementation**

Responsibility shared by the Town of Collingwood, the Ontario Ministry of Natural Resources and the federal Department of Oceans and Fisheries.

#### **Discussion**

The delisting strategy workshop agreed to revise the wording of the option to "maintain Option 10: Wetlands Preservation." The revision reflects present municipal practice, by which the wetlands have been classified under the Town's Official Plan as environmental protection areas. It was noted, however, that the current Official Plan does not have the power to protect wetlands. The group agreed that details of implementing this option would be explored as implementation agreements were negotiated.

**There was 100-per-cent consensus on including the revised OPTION 10: WETLANDS PRESERVATION, in the delisting strategy.**

#### **Status**

The Collingwood Harbour wetland is now designated as a provincially significant Class 2 Wetland by the Ontario Ministry of Natural Resources, and as an environmental protection area by the Town of Collingwood.



## **OPTION 11: When the Opportunity Arises, Implement Habitat Rehabilitation**

### **Proposal**

Rehabilitate areas of the harbour to provide fish and wildlife habitat.

### **IJC Impaired Uses Addressed: Loss of Fish and Wildlife Habitat**

### **Objectives**

Rehabilitation of aquatic habitat would continue to improving fish and wildlife populations in the harbour. It would also ensure the PAC's Use Goal for the harbour as an area for nature observation.

### **Description**

Shallow-water areas may be created to provide a productive littoral zone for fish and wildlife. Near-shore development could include rip-rap shore protection that will in turn provide cover to fish and other aquatic organisms. Consideration should be given to creating offshore artificial shoals for fish habitat restoration, in areas that would not interfere with other harbour uses. The Town of Collingwood should develop a long-term plan for the harbour that takes into consideration the desired goal to rehabilitate fish and wildlife habitat. All development within the harbour should have regard for the protection of existing habitat and the provision of more habitat, and the Official Plan should reflect that goal.

In response to the invasion of Purple Loosestrife in the Collingwood Wetland Complex, a program to control the spread of the "beautiful killer" was initiated in July, 1992.

**Related Projects:** Option 10, Wetlands Preservation, Option 13: Black Ash Creek Rehabilitation Project

### **Benefits**

- a) Rehabilitation will expand fish and wildlife habitat for nature observation and sport fishing.
- b) With the transition to commercial/residential and recreational uses of the harbour--a transition that is likely to continue in the future--more habitat for fish and wildlife may help to ensure the socioeconomic benefits of increased tourism and urban redevelopment of the harbour. As a venue for sightseeing, sport fishing and nature observation,

expanded fish and wildlife habitat may provide an attraction for tourists and potential residents.

c) Rehabilitation will enhance the general aesthetics of the harbour and its environs.

d) The expenditures on habitat rehabilitation, on the order of \$2,000 per metre of shoreline, may provide a direct benefit to the local construction industry.

e) Control of the infestation of Purple Loosestrife may be the only means available to protect and rehabilitate the existing habitat in the Collingwood Wetland Complex.

**Probable Effectiveness:** Very High

### **Potential Obstacles to Implementation**

a) Rehabilitation of habitat requires the co-operation of developers.

b) Will require amendment of the Town of Collingwood's Official Plan.

c) Physical removal of Purple Loosestrife is exceedingly labour intensive and the anticipated results are unproven in a stand that is of extremely high density.

**Cost:** Approximately \$2,000 per meter of shoreline, assuming 8 m width and 2 m depth. Purple Loosestrife Control Program currently dependent on volunteer labour.

### **Funding**

The direct cost of habitat rehabilitation would be borne by developers. The Town of Collingwood would incur the costs of amending its Official Plan. The Town would incur the costs of hiring a work crew to control Purple Loosestrife over a long term period.

### **Responsibility for Implementation**

Responsibility for initiating habitat rehabilitation will be shared by the Town of Collingwood and any parties undertaking onshore development.

### **Discussion**

At the delisting strategy workshop, it was noted that habitat rehabilitation can provide permanent cover for invertebrates, fish and wildlife in a way that would enhance the harbour's ecosystem. Discussion focused on who should be responsible for habitat rehabilitation. It was advanced that developers should be required to undertake this

option, but the argument was made that since new habitat would provide cover for sport fish, developers should not have to pay for rehabilitation that will benefit anglers.

There was, however, overall agreement that the wording of this option should be strengthened to reinforce habitat rehabilitation for fish and wildlife. It was agreed that the description of the option as given in *Making Choices* be amended to read: "All development within the harbour should have regard for the protection of existing habitat and the provision of more habitat, *and the Official Plan should reflect that goal.*"

**There was 100-per-cent consensus to include OPTION 11: WHEN THE OPPORTUNITY ARISES, IMPLEMENT HABITAT REHABILITATION, in the delisting strategy as revised.**

**Status:** Purple Loosestrife Control Program initiated July 1992, remainder to be implemented.

#### 4.6 ADDITIONAL OPTIONS TO BE INCLUDED IN RAP

*At the RAP/PAC delisting strategy workshop, the groups decided upon several remedial actions that are desirable and should be included in the RAP Stage 2 document, but are not deemed to be of as high a priority for attaining the proposed delisting criteria for Collingwood Harbour.*

*There was 100-per-cent consensus on including the following remedial actions in the Collingwood Harbour RAP.*

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##### **OPTION 13: Black Ash Creek Rehabilitation Program**

###### **Proposal**

Establish a stormwater management plan by creating an environmental zone along the limits of Black Ash Creek and the canals, within which bank stabilization can be achieved through revegetation of riparian zones, bioengineering, rock rubble placement, root wad placement, bank regrading, and construction of vortex weirs to divert the main current flow away from unstable banks, thereby reducing nutrient and suspended sediment load to the harbour. Rehabilitation of coldwater habitat in conjunction with the project would enhance native brook trout populations and provide migratory rainbow trout spawning and rearing habitat.

**IJC Beneficial Uses Addressed:** Eutrophication or Undesirable Algae;  
Degradation of Aesthetics; Degradation of Fish and Wildlife Habitat

###### **Objectives**

A buffer zone along Black Ash Creek and the canals could result in decreased loading of silt and phosphorus into the harbour from the watershed. Stormwater management will also reduce bacterial loading to the harbour. Provision of cold water habitat will enhance fish and wildlife communities in Collingwood Harbour.

###### **Description**

With respect to Black Ash Creek, several areas have been proposed for the creation of a vegetated buffer zone: along the creek within the Town, and at the upper end of

Black Ash Creek's tributaries. The zones would be planted with trees, other riparian vegetation, or stabilized with rock rubble, bank regrading, and current diversion away from unstable banks. Cooperation with local farmers could provide alternate watering facilities for livestock and restrict access to two sites on the main branch and one location on a smaller tributary. Coldwater rehabilitation work on the main branch of the Creek will emphasize the creation of spawning and early rearing habitat for rainbow trout. Applicable rehabilitation techniques include selective debris removal, brush bundling, beaver pond management, bank revegetation, and instream cover construction. Coldwater habitat rehabilitation with focus on brook trout habitat based on 1992 assessment data that will indicate whether these fish are present or could be successfully reintroduced. A coarse sediment trap could be constructed in the main branch of Black Ash Creek to trap materials discharged from the stream bed further upstream during stream rehabilitation works. The same principles could apply to the canals, although due to their intermittent nature, the likelihood of successful habitat rehabilitation is extremely low.

**Related Projects:** To be implemented in conjunction with Option 26, Agricultural programs.

### **Benefits**

- a) Stormwater management through the creation of a buffer zone would reduce excessive phosphorus and silt loading to the harbour during peak storm periods, thereby reducing the occurrence of nuisance algal growth in the harbour and enhancing aesthetics.
- b) Revegetation as a buffer is a "natural" approach to abating erosion and consequent pollution.
- c) Improvements to the quality of Black Ash Creek could enhance fisheries habitat and make this project eligible for funding under Environment Canada's Great Lakes Cleanup Fund and other agency programs.
- d) Reducing erosion is of benefit to the agricultural sector, and projects could be funded in part under Agriculture Canada's Fragile Land Retirement program and the Ontario Ministry of Agriculture and Food's Land Stewardship program.

### **Potential Obstacles to Implementation**

- a) Most of the land in the Townships, where the buffer zone at the upper reaches of the creek would have to be located, is privately owned. Vegetated zones could not be forced upon landowners.
- b) Land values are high, especially towards the mouth of the creek.
- c) Since the flood runs from west to east, a buffer along the east side of the creek and

canals would do nothing to aid retention.

d) If phosphorus and silt loadings from the creek and canals are principally from sediment resuspension within the tributaries, erosion control may be ineffective at restricting these inputs.

**Cost:** Dependent on activity and location; over \$1 million committed by the Nottawassa Valley Conservation Authority for erosion control during Black Ash Creek modifications for flood control.

### **Funding**

\$60,000 committed through MOEs Cleansweep lottery funds, \$50,000 through Environment Canada's Cleanup Fund, and \$10,000 through the RAP budget. Further project support received from the NVCA, MNR, Rotary Club, other service clubs and local volunteers. Potential funding could be available through Agriculture Canada's Fragile Land Retirement program, the Ontario Ministry of the Environment, the Ontario Ministry of Natural Resources CFIP Program, and the Ontario Ministry of Agriculture and Food's Land Stewardship, Technology Transfer, or Education and Promotion programs.

**Status:** Initiated. With a \$60,000 grant from Cleansweep for 18 months, commencing in 1991/92, the NVCA, in conjunction with MNR and MOE have hired staff to develop an inventory of erosion control and fisheries enhancement programs, to be implemented in cooperation with local citizens. All available social, physical, chemical and biological background data has been summarized. Assessment data to provide baseline information for the RAP's monitoring program is underway. Stream bank stabilization and erosion control, stream corridor revegetation, construction of controlled stream access areas for livestock, construction of upgraded manure management structures, and fish and wildlife habitat at specific sites is projected for 1992, and extending into 1993.



## **OPTION 26: Agricultural Programs**

### **Proposal**

Apply the Ontario Ministry of Agriculture and Food's Land Stewardship principles of conservation tillage at agricultural sites that are part of the Black Ash Creek watershed. Reduce soil erosion by participation in Agriculture Canada's Fragile Land Retirement program.

**IJC Beneficial Uses Addressed:** Eutrophication or Undesirable Algae;  
Degradation of Aesthetics

### **Description**

Soil conservation techniques could be encouraged by the introduction of an extensive public awareness program, showing farmers alternative tillage methods and demonstrating the benefits, in terms of labour and profits, of no-tillage crops. The techniques for soil conservation used by SWEEP, a federal-provincial initiative to reduce phosphorus loading from agricultural sources in the Lake Erie basin, could be applied to the Collingwood area. Along with this program, on-farm research could be conducted, perhaps in conjunction with the Ontario Ministry of Agriculture and Food, to determine the applicability of conservation-tillage principles in the Black Ash Creek watershed. The Ontario Ministry of Agriculture and Food's Land Stewardship program and Agriculture Canada's Fragile Land Retirement initiative could become involved in the implementation of conservation tillage.

**Related Projects:** Option 13, Black Ash Creek Rehabilitation Project

### **Benefits**

- a) The application of the principles of low- or no-tillage agricultural practices in the Black Ash Creek watershed could significantly reduce the amount of phosphorus drained into the creek. Creation of buffer strips and tree planting would stabilize erosion of soils into Black Ash Creek, thereby reducing its contribution of phosphorus, bacteria and other contaminants to the harbour.
- b) Test studies conducted under the SWEEP program indicate that conservation tillage can be both sustainable and cost effective for agriculture.
- c) An awareness campaign promoting the principles of conservation tillage will foster among the agricultural community an enhanced perception of environmentally sound farming practices, reinforcing the importance of community participation in maintaining and restoring water quality in the harbour.

## **Potential Obstacles to Implementation**

- a) Conservation tillage has been found to be more effective with certain types of soil than with others. Some degree of preliminary investigation needs to be conducted before low-tillage practices can be feasibly implemented in the area.
- b) Because of the relatively small contribution of phosphorus from Black Ash Creek to the harbour, these programs may have no measurable effect on water quality.

**Cost:** see Option 13.

## **Funding**

Current awareness incentives are funded through the Ontario Ministry of the Environment. Future applications of soil-conservation techniques could be funded through the provincial Land Stewardship program and/or the federal Fragile Land Retirement program, as well as the local agricultural community.

## **Responsibility for Implementation**

The Public Awareness Subcommittee of the PAC has already begun awareness campaigns for environmentally sound agricultural techniques. Specific conservation-tillage initiatives could be undertaken through federal and provincial programs, and through the efforts of the Nottawasaga Conservation Authority and the agricultural community.

**Status:** Awareness programs begun by Public Awareness Subcommittee; delineation of specific initiatives being investigated by the Nottawasaga Conservation Authority in co-operation with MNR and MOE, as for Option 13.

## **OPTION 17: Environmental Playground**

### **Proposal**

Build an adventure-style playground with an environmental theme.

**IJC Beneficial Uses Addressed:** Eutrophication or Undesirable Algae;  
Degradation of Aesthetics

### **Objectives**

The environmental playground, called ENVIROPARK, is designed to raise children's level of awareness about the connection between their lifestyle choices and the environmental health of Collingwood Harbour. It will reinforce, therefore, the important concept of environmental responsibility by educating children and parents in an active, "hands-on" way, about the water- and waste-water-treatment process, about the flow of water and waste into the harbour from the sewage treatment plant and from watershed run-off, and about the choices that they can make to contribute to a clean harbour. With the participation of schools, parents and tourists, ENVIROPARK will broaden awareness of water-quality issues beyond the harbour area. With this heightened public awareness, loading of nutrients and phosphorus to the STP should be reduced, as should the level of pollutants entering the harbour's waters through the storm sewer system.

### **Description**

ENVIROPARK is adapting play structures to incorporate an environmental theme, and is estimated to occupy two acres of land in Sunset Point Park. In the new playground, children will learn about the effects that their everyday lives have on the environment through a series of structures that show, among other things, the link between water supply and the home, the significance of the transfer of contaminants along the food chain, and the impact of urban and agricultural run-off on water quality. Each play structure will be accompanied by an informative sign illustrating the significance of the activities. The new structures will include:

- i) A series of climbing bars, tubes and slides that represent the town's sewage network.
- ii) An obstacle course demonstrating the food chain.
- iii) An enlarged modification of the Ontario Waste Management Corporation "Envirodial" that introduces the child to alternatives to hazardous materials.

- iv) A model farm and surrounding lands that show the impact of fertilizers and animal waste on run-off quality of water courses.
- v) Play structures that represent industrial and commercial use and discharge of water, as well as the operation of the municipal pumping station and the sewage treatment plant.
- vi) A boat located in a representation of the harbour to teach children and those that accompany them about boat cleaning.

#### **Related Projects** None

#### **Benefits**

- a) ENVIROPARK will encourage public awareness about water-quality issues in Collingwood.
- b) By addressing children in an active way, the playground will help to ensure community involvement in environmental issues in the future.
- c) The playground should contribute to the ongoing reorientation of the harbour as a site for residential/commercial and recreational uses, and as an attraction for tourists.

**Cost:** To May 1992, the cost of preparing conceptual design, site and apparatus plans, as well as site preparation and construction costs was \$150,000. The projected costs for construction of the park itself have been estimated at \$200,000-\$225,000.

#### **Funding**

Funding for the ENVIROPARK has been obtained through grants from the Ronald McDonald Children's Charity, and through the federal Great Lakes Cleanup Fund, the Town of Collingwood, the Ontario Ministry of the Environment, the Optimist Club, and the Rotary Club. Additional funding may also be forthcoming from local businesses and industry.

#### **Responsibility for Implementation**

The construction of ENVIROPARK is overseen by the Public Awareness Subcommittee, in consultation with the RAP Team and the PAC as a whole, and in co-ordination with the Town of Collingwood. A local contractor, was awarded the tender to complete construction.

**Status:** Conceptual designs and plans were completed in March, 1991. Construction was initiated in May 1992, with expected completion in Fall, 1992.

## **OPTION 18: RAP Communications Plan**

### **Proposal**

Implement a multi-media communications plan for the Collingwood Harbour RAP, providing information about the RAP's progress and goals and encouraging the involvement of the public.

### **IJC Beneficial Uses Addressed: All**

### **Objectives**

The purpose of the communications plan is twofold: first, to inform the community about the progress made in the RAP process and about issues and events affecting the health of the harbour; second, to encourage public involvement in the RAP process and in daily activities for restoring and maintaining the cleanliness of the harbour's waters.

### **Description**

A number of methods have been or will be used to get the RAP message across to the community. Among those are the distribution of fact sheets, pins, T-shirts, refrigerator magnets (ongoing); information boards; preparation of RAP video presentations; and newsletters. Signs at public launches and at the entrance to the elevator pier have improved the visibility of the RAP. Announcements of RAP events and information spots by local newspapers, television and radio also form part of the complete communications plan. The RAP Team and members of the PAC have also been involved in biennial Harbour Day celebrations, including a Harbour Art contest, RAP sweatshirt prizes and guided harbour cruises.

**Related Projects:** Other specific communications initiatives.

### **Benefits**

- a) The communications plan helps to foster among the community a sense of their importance in maintaining and restoring water quality in Collingwood Harbour.
- b) Creates a communications structure by which the public will continue to be informed about the process and achievements of the Remedial Action Plan.

**Cost:** Dependent on specific action.



**Funding:** RAP budget; potential for PAC to generate budget following PAC incorporation.

**Responsibility for Implementation**

Responsibility is shared among the RAP Team, the Public Advisory Committee and the Public Awareness Subcommittee.

**Status:** The communications plan is ongoing, in the forms described above. Other public awareness actions will be implemented as needed or afforded.

## **OPTION 19: Environmental Resource Centre**

### **Proposal**

Establish an environmental resource centre to provide an information station for the harbour environment.

**IJC Beneficial Uses Addressed:** All

### **Objectives**

The environmental resource centre provides both general information about environmental issues and concerns, and specific updates on the status of Collingwood Harbour's waters, the local ecosystem and RAP activities.

### **Description**

The resource centre includes books, articles and fact sheets that deal with relevant environmental issues; the materials are not necessarily limited to RAP publications. The centre, therefore, is an extension of the RAP documents that are already made available to the community at the public library. A system for keeping the collection up to date is also part of the program.

**Related Projects:** Other communications initiatives.

### **Benefits**

a) Enhances public awareness about RAP process and issues of water quality in Collingwood Harbour.

**Cost:** Approximately \$1,000 per annum.

### **Funding**

As needed, literature will be provided by MOE, MNR, OMAF, Environment Canada and the municipal Public Utilities Commission, and will be purchased through the RAP or PAC budget.

**Responsibility for Implementation:** PAC, Public Awareness Subcommittee.

**Status:** An environmental resource centre has been set up at the municipal Public Utilities Commission building. Its holdings continue to expand with further RAP publications and as other materials are deemed necessary or desirable. Other sites for environmental resource centres are under consideration.

## **OPTION 20: RAP Teaching/Information Package**

### **Proposal**

Distribute to the library, interested citizens, clubs and schools a RAP teaching/information package, designed to help the community better understand environmental issues and the factors influencing the harbour ecosystem.

**IJC Beneficial Uses Addressed:** All

### **Objectives**

By informing individuals, educators and students, the RAP teaching/information package will contribute to public awareness about the ecological choices and decisions that face the community of Collingwood. With a focus on explaining the flow of phosphorus and other nutrients from the community into the harbour's waters, and by emphasizing particular methods of water conservation and environmentally friendly household alternatives, the package should increase awareness about these issues and reduce the level of environmentally damaging substances in the harbour.

### **Description**

The teaching/information package, *Explorations: A Discovery Guide*, includes several educational materials: information sheets, a bibliography of relevant environmental source books, maps, charts and diagrams. In particular, the package includes exercises for a range of disciplines, using the harbour resources. Units for art, biology, chemistry, craft trades, ecology, economics, English, social and physical geography, history, music and physics refer to the harbour ecosystem, zero discharge, land-use planning as it affects water quality, and a host of other relevant issues. A poster-size diagram depicting the relationship between human uses of the harbour and its surrounding environment--domestic, agricultural, industrial, recreational--and demonstrating the human and natural ecosystem influencing the harbour and the condition of its water has been distributed to all area schools.

**Related Projects:** Other communications initiatives.

**Benefits**

- a) Provides a means for ongoing public awareness and input in the process of remedial action.
- b) Encourages among the community environmentally sound practices.

**Cost:** \$10,000

**Funding:** Provided from RAP budget.

**Responsibility for Implementation**

Primary responsibility for development of the teaching/education package has been with the PAC's Public Awareness Subcommittee. Once the package is distributed, however, part of the responsibility for its effectiveness lies with teachers, students and the community as a whole.

**Status:** The RAP teaching/information package was completed and distributed to schools in March, 1992. Further, up-to-date packages will be prepared and distributed in future years as needed.

## **OPTION 21: RAP Bulletin Board**

### **Proposal**

Install a bulletin board at a highly visible location in proximity to the harbour to provide information on the RAP process and environmental issues, and targeted specifically at harbour users.

### **IJC Beneficial Uses Addressed: All**

### **Objectives**

Beyond being a general source of information for the community about the Collingwood Harbour RAP and the condition of the harbour, the bulletin board will be directed at specific users of the harbour, informing them about environmentally responsible habits and encouraging them to get involved in the restoration and maintenance of clean water.

### **Description**

The bulletin board may be set up near the north main public landing in the harbour. It will consist of a large, enclosed display case in which information about the RAP is posted. As RAP information changes, so would the bulletin board. Displays will include information about non-polluting boating practices, alternatives to ecologically damaging household products, updates on fish populations and notification of RAP programs.

**Related Projects:** Other communications initiatives.

### **Benefits**

- a) Promotes public awareness, specifically targeting those members of the community who use the harbour most.
- b) As recreational use of the harbour increases, and with the potential for commercial/residential redevelopment of the waterfront, displaying information about water-quality maintenance and restoration near the harbour itself will have an increasingly important educational role.

**Cost:** \$2,000 (estimated)



**Funding:** RAP/PAC budget.

**Responsibility for Implementation**

The Public Advisory Committee will be responsible for maintenance of the bulletin board, while both the PAC and the RAP Team will be responsible for providing materials for posting.

**Status:** Scheduled for installation in Spring, 1992.

## **OPTION 22: Mariner Education Program**

### **Proposal**

Implement a mariner education program in the harbour area to educate and inform boaters about environmentally responsible boating practices. The primary media for the program would be a bilge kit and environmental fact sheets targeted specifically at boaters, and made available at marinas and boat launches through marina newsletters.

**IJC Beneficial Uses Addressed:** Eutrophication or Undesirable Algae; Degradation of Aesthetics; Degradation of Fish and Wildlife Populations; Beach Closings; Degradation of Phytoplankton and Zooplankton Populations

### **Objectives**

By informing boaters about the ways that they can reduce pollution in the harbour, the mariner education program should cut back on the levels of sewage, nutrients and harmful chemicals in the harbour's waters.

### **Description**

Circulation of fact sheets at marinas and launches will be increased to give information on safe handling of fuels, spills-response plans and ways to avoid pollution caused by heads and boats' holding tanks. The bilge kit consists of a reusable absorbant fabric that will prevent the escape of contaminants from bilge waters. Fact sheets could also be posted on fuel pumps. The program will encourage boaters to use harbour-friendly consumer products, including cleaners, paints, fuels and anti-freeze, that are frequently spilled or dumped directly into the harbour. Local radio, television and newspaper advertisements may be used to complement the role of the fact sheets.

**Related Projects:** Other communications initiatives.

### **Benefits**

- a) Contributes to public awareness about water-quality issues, specifically targeting the boating community.
- b) Creates a communications network by which information about the RAP and environmentally sound boating practices can be distributed as recreational uses of the harbour, particularly boating, increase.

**Cost:** \$1,200 (estimated)

**Funding:** RAP budget.

**Responsibility for Implementation**

Public Awareness Subcommittee, PAC, RAP Team. The program will also require some co-operation from marina operators.

**Status:** The bilge kit was distributed among members of the boating community during the spring and summer of 1991, and other initiatives described above are planned to be implemented during the boating season in 1992.

## **OPTION 23: Information for Ice Fishermen**

### **Proposal**

Develop information specifically targeted for ice fishermen and place brief slogans on garbage receptacles in the vicinity of fishing huts.

**IJC Beneficial Uses Addressed:** Eutrophication or Undesirable Algae; Degradation of Aesthetics; Degradation of Fish and Wildlife Populations; Beach Closings; Degradation of Phytoplankton Zooplankton Populations

### **Objectives**

By informing ice fishermen about the ways they can reduce pollution in the harbour, the information could help to reduce the amount of nutrients, harmful chemicals, trash and grey water entering the harbour.

### **Description**

Distribution of logos and slogans on garbage receptacles during the winter period of ice cover should encourage ice fishermen to use environmentally responsible consumer products. They will also inform fishermen about the importance of responsible waste disposal. Garbage receptacles will be placed in proximity to ice-fishing huts. This program will also make use of the RAP Bulletin Board, displaying fact sheets and other information specifically directed at ice fishermen.

**Related Projects:** RAP Bulletin Board; other communications initiatives.

### **Benefits**

- a) Encourages public awareness about water-quality issues and the importance of environmentally responsible choices, specifically targeting ice fishermen, who constitute a significant presence in the harbour during the winter months. According to the *Socioeconomic Profile of the Town of Collingwood*, some 50 ice-fishing huts are present in the harbour during periods of ice cover.
- b) Establishes a network by which the RAP message can be communicated in the future as ice fishing and other winter recreational uses of the harbour increase.

**Cost:** \$1,000

**Funding:** RAP budget.

**Responsibility for Implementation**

Public Awareness Subcommittee, with co-operation of RAP Team and the PAC.

**Status:** Decals are completed, to be installed prior to ice-fishing season in January, 1992.

## **OPTION 24: Control of Phosphorus in Detergents**

### **Proposal**

Prohibit or discourage the use of high-phosphorus detergents and soaps.

**IJC Beneficial Uses Addressed:** Eutrophication or Undesirable Algae;  
Degradation of Aesthetics

### **Objectives**

Eliminating the use of detergents containing phosphorus will significantly reduce the amount of phosphorus contributed to the sewage treatment plant from household sources.

### **Description**

Encouraging the use of phosphate-free and alternative detergents, such as baking soda and vinegar, has already been undertaken by the PAC's Public Awareness Subcommittee. The public information initiatives will continue through newspaper announcements and fact sheets. In the future, a prohibition on high-phosphorus cleaners as a municipal bylaw could also be used to more directly address the major pollution problem in the harbour: the level of phosphorus, which causes nuisance growth of algae.

**Related Projects:** Other communications initiatives.

### **Benefits**

- a) The use of phosphate-free household products should decrease phosphorus loading to the STP, contributing to fewer occurrences of nuisance algal growth in the harbour.
- b) Encouraging environmentally sound household practices provides a long-term contribution to water quality by changing behavior.

**Cost:** Not available.

### **Funding**



Funding for the Public Awareness Subcommittee's activities is provided by Environment Ontario through the RAP budget. If the PAC incorporates, further initiatives would be directly supported through the PAC budget. If municipal bylaws prohibiting phosphates are passed in the future, the Town will incur the costs of implementing and enforcing them.

### **Responsibility for Implementation**

The RAP Team and the Public Awareness Subcommittee are responsible for the public information aspects of this program. The Town of Collingwood would be responsible for any future legislative action.

**Status:** Public information initiatives are ongoing. Legislative action may be implemented in future if needed or if desired by the Town of Collingwood.

## **OPTION 25: Control Fertilizers and Pesticides**

### **Proposal**

Restrict or discourage the use of phosphorus fertilizers and encourage slow-release products, both for residents and golf courses. Restrict or discourage the use of persistent pesticides.

**IJC Beneficial Uses Addressed:** Eutrophication or Undesirable Algae; Degradation of Aesthetics; Degradation of Fish and Wildlife Populations; Beach Closings; Degradation of Phytoplankton and Zooplankton Populations; Fish Tumours and Other Deformities; Bird or Animal Deformities or Reproductive Problems

### **Objectives**

Limiting phosphorus fertilizers addresses the problem of phosphorus levels in run-off to the harbour, which constitute the major water-pollution priority, and represents a pollution prevention initiative. With the use of phosphorus and of pesticides in the area restricted, the amount of contaminated material entering the harbour due to run-off and spills would be reduced. Persistent pesticides--those that remain in the ecosystem for a long time--would be phased out of the ecosystem through non-use.

### **Description**

A restriction on the use of persistent pesticides and phosphorus fertilizers could be carried out on the level of municipal bylaw. Alternatively, the Public Awareness Subcommittee and other members of the community could actively discourage the use of inappropriate chemicals, in keeping with the PAC's commitment to virtual elimination of toxic substances. Through newspaper "RAP Rap" articles and other media, the Public Awareness Subcommittee has already been encouraging the use of nonharmful pest-control methods. Other public education initiatives may also be used to promote the use of compost or slow-release fertilizers for domestic and commercial use, and to recommend that fertilizer application be based on soil test results.

**Related Projects:** Other communications initiatives.

## **Benefits**

a) Discouraging the use of phosphorus fertilizers and other materials that contain substances harmful to water quality should reduce nutrient loading to the harbour, while at the same time reducing other contaminants in the harbour's waters.

**Cost:** Not available.

## **Funding**

Funding for the Public Awareness Subcommittee's activities is provided by Environment Ontario through the RAP budget. If municipal bylaws prohibiting phosphate fertilizers and persistent pesticides are passed in the future, the Town will incur the costs of implementing and enforcing them.

## **Responsibility for Implementation**

The RAP Team and the Public Awareness Subcommittee are responsible for the public information aspects of this program. The Town of Collingwood would be responsible for any future legislative action.

**Status:** Public education about the use of non-phosphate fertilizers and alternative, safe methods of pest control has already been undertaken by the PAC and the Public Awareness Subcommittee. Legislative action may be initiated in the future if needed or if desired by the Town of Collingwood.

## **OPTION 28: Composting and Water-Conserving Toilets**

### **Proposal**

Encourage the use of composting toilets to reduce the loading on the STP from households. Install water-conserving toilets in all new homes being constructed.

**IJC Beneficial Uses Addressed:** Eutrophication or Undesirable Algae;  
Degradation of Aesthetics

### **Objectives**

The use of composting and/or water-conserving toilets in households could significantly reduce the amount of phosphorus and other nutrients in the harbour by reducing the volume of effluent treated by the STP.

### **Description**

The use of composting toilets may be encouraged for residents of the area, for whom composting toilets, with their benefits and drawbacks, may be appropriate. Composting toilets treat human waste on site, meaning that it does not have to be transported for treatment at a central STP. However, they are high-maintenance systems, and are very expensive in comparison with conventional toilets. Encouraging the use of such devices, therefore, must be conducted with a view to their suitability in the community.

Water-conserving toilets, although they may be more costly than conventional fixtures, could be required for all new homes.

**Related Projects:** Other communications initiatives.

### **Benefits**

- a) Use of composting toilets could reduce loading to the STP, easing capacity pressures and contributing to the plant's efficiency.
- b) If 10% of the population of Collingwood adopted composting toilets, an estimated 2400 kg/yr less phosphorus would reach the STP, and 14 million gallons (54 million litres) of water would be saved per annum (Wynia et al. 1990).

**Cost:** \$1,200 - 1,500

## **Funding**

If municipal bylaws requiring installation of water-conserving or composting toilets is passed in the future, the Town would incur the costs of implementing and enforcing the bylaws. Costs of public education initiatives may be borne by Environment Ontario through the RAP budget, or by the PAC budget, when PAC incorporates.

## **Responsibility for Implementation**

The RAP Team and the Public Awareness Subcommittee are responsible for the public information aspects of this program. The Town of Collingwood would be responsible for implementing and enforcing any bylaws requiring water-conserving and/or composting toilets.

**Status:** To be implemented in future.

## **OPTION 29: Control Grey-Water Discharge from Boats**

### **Proposal**

Restrict the effects of discharge of grey water in Collingwood Harbour. *Phrasing revised from Making Choices to read: Reduce water-quality impairment in Collingwood Harbour caused by grey water from boats.*

**IJC Beneficial Uses Addressed:** Eutrophication or Undesirable Algae; Degradation of Aesthetics; Degradation of Phytoplankton and Zooplankton Populations

### **Objectives**

Reducing phosphorus, bacterial and other contaminant loads associated with grey-water discharge would contribute to the improvement of water quality in those areas of the harbour where boat density is high and water circulation is restricted. Stopping this source of phosphorus contamination would aid the community in contributing to the restoration of water quality. Environment Ontario is considering an amendment to regulations under the Environmental Protection Act that will require grey-water holding tanks on new vessels in the latter part of this decade.

### **Description**

While phosphorus and bacterial contributions from grey water are relatively small, there may be the potential for elevated levels of these substances beyond recreational standards in heavily used embayments that are shallow or have confined circulation.

The adverse effects of grey-water discharge can be controlled in several ways. Use of phosphorus-free detergents on boats can be made mandatory, and a ban on toxic cleaning agents could be imposed. Collingwood Town Council could submit a motion to the province to consider a ban on environmentally hurtful products.

**Related Projects:** Other public awareness/education initiatives.

### **Benefits**

- a) Reducing grey-water discharge should decrease the loadings of phosphorus, bacteria and other contaminants to the harbour.
- b) A program designed to reduce grey water addresses the increasing recreational and residential/commercial uses of the harbour in the future. Boating is likely to increase under proposed plans for waterfront redevelopment.



**Cost:** Dependent on action taken.

**Funding:** Individual boaters responsible for cost incurred by installation of grey-water holding tanks, if they are so mandated by the province.

**Responsibility for Implementation:** Environment Ontario, Town of Collingwood.

**Status:** Clean boating information packages continue to be distributed by PAC to boaters.

## **4.7 FUTURE OPTIONS**

*At the Nov. 19-to-20, 1991, delisting strategy workshop, the RAP Team and the PAC agreed that the effects of the options in the delisting strategy would be monitored for two years following implementation of Option 7. The group agreed that within that time period it would be established whether Option 1, Industrial Sewage Treatment Plant, or Option 9, Pretreatment, Option 3, Tertiary Treatment, or Option 8, New Technologies at Industry should be implemented. If not required at that time, future growth and expansion of the Town may still require the implementation of Option 1, 3, 9 or 8.*

*There was 100-per-cent consensus on including these options in the RAP Stage 2 document as future options.*

---

### **OPTION 1: Industrial Sewage Treatment Plant**

#### **Proposal**

Construct a sewage treatment plant at the industrial park for treatment of industrial effluent.

**IJC Beneficial Uses Addressed:** Eutrophication or Undesirable Algae;  
Degradation of Aesthetics

#### **Objectives**

Building a sewage treatment plant (STP) close to industrial sources of waste water would reduce the amount of waste sent to the existing municipal STP. Because a portion of the phosphorus and hydraulic load sent to the STP now comes from industrial sources, this would relieve pressure on the existing STP, enabling the municipal operation to treat waste more efficiently, and providing for Town expansion.

#### **Description**

An industrial STP would have to be capable of providing tertiary treatment, the best technology currently available which would achieve the lowest possible effluent total phosphorus concentrations. The outfall would be built east of the water intake of the Public Utilities Commission in Nottawasaga Bay.

**Related Projects:** None.

## **Benefits**

- a) An industrial STP could treat industrial effluent more efficiently than the existing plant.
- b) An industrial plant would reduce P loads to the harbour from the existing municipal facilities.
- c) The new plant would free up capacity for the existing STP to devote to commercial and residential use. In this way, the industrial STP would aid in the accommodation of the trend in Collingwood towards increased commercial/residential and recreational socioeconomic activity.

## **Potential Obstacles to Implementation**

- a) While less costly than building a new municipal STP, an industrial STP would still be very expensive.
- b) Because the outfall for an industrial STP would flow into Nottawasaga Bay, a complete environmental assessment would be required before implementation. That would be expensive and time-consuming: the minimum length of time for an environmental assessment is five years.
- c) The installation of STP technology in an area close to the major industries would require new piping and new pump houses, adding significantly to cost.

**Cost:** \$21,319,000

## **Funding**

Most of the cost of building an industrial STP would be borne by the industries that would use it.

**Responsibility for Implementation:** Local industry, in co-operation with the municipality.

**Status:** Future option for consideration.

## **OPTION 9: Pre-treatment**

### **Proposal**

Pre-treat industrial effluent before discharge to the sewer system.

**IJC Beneficial Uses Addressed:** Eutrophication or Undesirable Algae;  
Degradation of Aesthetics

### **Objectives**

Because industry is a contributor of phosphorus to the STP, the pre-treatment of industrial effluent would reduce the amount of phosphorus the STP would have to process, and therefore reduce the cost of STP operation. Other contaminants that the STP is not designed to treat could also be eliminated from industrial effluent.

### **Description**

Some industries already have in place detention ponds for the storage of waste water until the STP can accommodate it, and making these ponds more efficient in their handling of waste is part of an ongoing effort. But pre-treatment could also include the installation of equipment in a pre-treatment facility in the industrial park, to be used jointly by major phosphorus producers in the area. Such a facility would enhance existing phosphorus-removal systems. As well, industries coming into the area would be made aware of pre-treatment requirements.

Requirements for pre-treatment may fall under the aegis of the Municipal Industrial Strategy for Abatement (MISA), whose mandate is to develop methods for pollution abatement in co-operation with municipalities and industries. The program's standard for pollution abatement is the Best Available Technology which is Economically Achievable (BATEA). While it is unclear how MISA will effect the types of industry in Collingwood, the implementation of this option would not be limited to the MISA standard, since BATEA may not be sufficient for the water-quality requirements of Collingwood Harbour. On the other hand, the involvement of MISA may require the virtual elimination of toxic substances (also a PAC objective), and therefore pre-treatment may extend to substances other than phosphorus.

**Related Projects:** None.

### **Benefits**

- a) Enhanced pre-treatment would reduce the loading of phosphorus from industrial sources to the STP, resulting in more efficient STP operation.
- b) Removal of contaminants that cannot be treated by the STP would prevent contaminants from entering the harbour ecosystem, contributing to the accomplishment of the PAC's objective of virtual elimination of toxic substances.

### **Potential Obstacles to Implementation**

- a) Pre-treatment facilities would require extensive feasibility studies and environmental impact assessments for any outfall area, if effluent is not sent to the STP.
- b) The MISA standard for pollution abatement, BATEA, may not be sufficient for the restoration of water quality in Collingwood Harbour.
- c) Persistent toxic compounds are not typical of the waste streams of local industries.
- d) Pre-treatment would reduce the phosphorus load to the STP, but not the hydraulic load, which also must be reduced in order to lower total phosphorus loading to the harbour.
- e) Costs of expanding industrial pre-treatment facilities may not be justified by the marginal gains it would produce in the STP's operating efficiency.

**Cost:** \$2,300,000

**Funding:** Industries, municipality.

### **Responsibility for Implementation**

Industrial pre-treatment could be implemented under the Municipal Industrial Strategy for Abatement (MISA). Industry and the municipality would share responsibility for implementation as required under MISA.

**Status:** Future option.

### **OPTION 3: Tertiary Treatment**

#### **Proposal**

Install tertiary treatment facilities at the sewage treatment plant to further remove phosphorus and other nutrients.

**IJC Beneficial Uses Addressed:** Eutrophication or Undesirable Algae;  
Degradation of Aesthetics

#### **Objectives**

Tertiary sewage treatment equipment would result in a significant reduction in the levels of phosphorus and other nutrients in the harbour's waters.

#### **Description**

Tertiary technology, the best currently available, would reduce the concentration of phosphorus in the STP's discharge to approximately 0.3 mg/L or less. The existing STP technology provides secondary treatment, and its discharge has a phosphorus concentration between 0.4 and 0.8 mg/L. Under this option, better, effluent polishing would be required at the existing facilities, likely through the use of sand filters. That installation would require expansion of the current facilities, possibly into Harbourview Park.

**Related Projects:** None.

#### **Benefits**

- a) Tertiary treatment would provide effluent concentrations of 0.3 mg/L, or less, consistently. The receiving water modelling study conducted for the RAP found the harbour area in which phosphorus levels exceeded provincial guidelines was predicted to be reduced by a factor of 17.3 with the installation of tertiary treatment facilities at the STP (Figure 4.6).
- b) By reducing the occurrence of nuisance algal growth in the harbour, this option would provide many of the same social and economic benefits as other options aimed at reducing nutrient loading to the harbour.

#### **Potential Obstacles to Implementation**



- a) Tertiary technology is expensive, other options may accomplish the same result in water quality improvement.
- b) There is little room for expansion at the site of the existing STP. Land acquisition, future land uses and the possible detrimental aesthetic effects on Harbourview Park are matters for concern. Infilling of the harbour to provide for a filtration plant could be detrimental to the harbour ecosystem.

**Cost:** \$6,300,000 to \$15,176,000

**Funding**

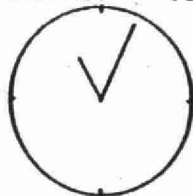
The municipality, assisted by applicable provincial grants, would be responsible for funding installation of tertiary treatment equipment.

**Responsibility for Implementation:** Town of Collingwood

**Status:** Future option.

Figure 4.6 PLUM DIAGRAM FROM HARBOUR MODELLING SHOWING RESULTS OF TERTIARY TREATMENT WITH PHOSPHORUS EFFLUENT CONCENTRATIONS OF 0.20 mg/L

NOV 21 15001 STEPS

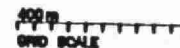


PM

# COLLINGWOOD HARBOUR

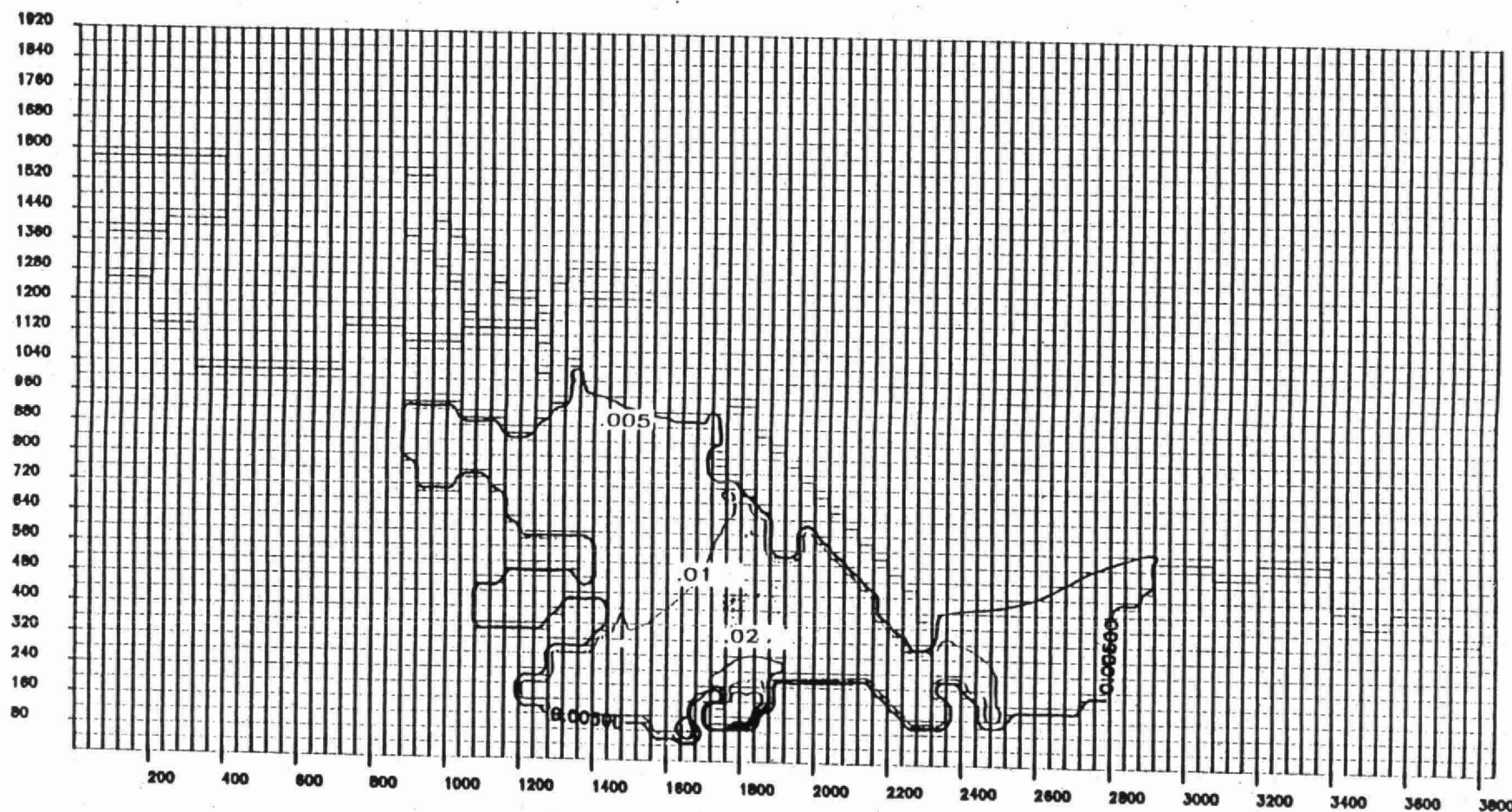
EAST GAP NOVEMBER  
TOTAL PHOSPHORUS

WIND  
0.2 M/S



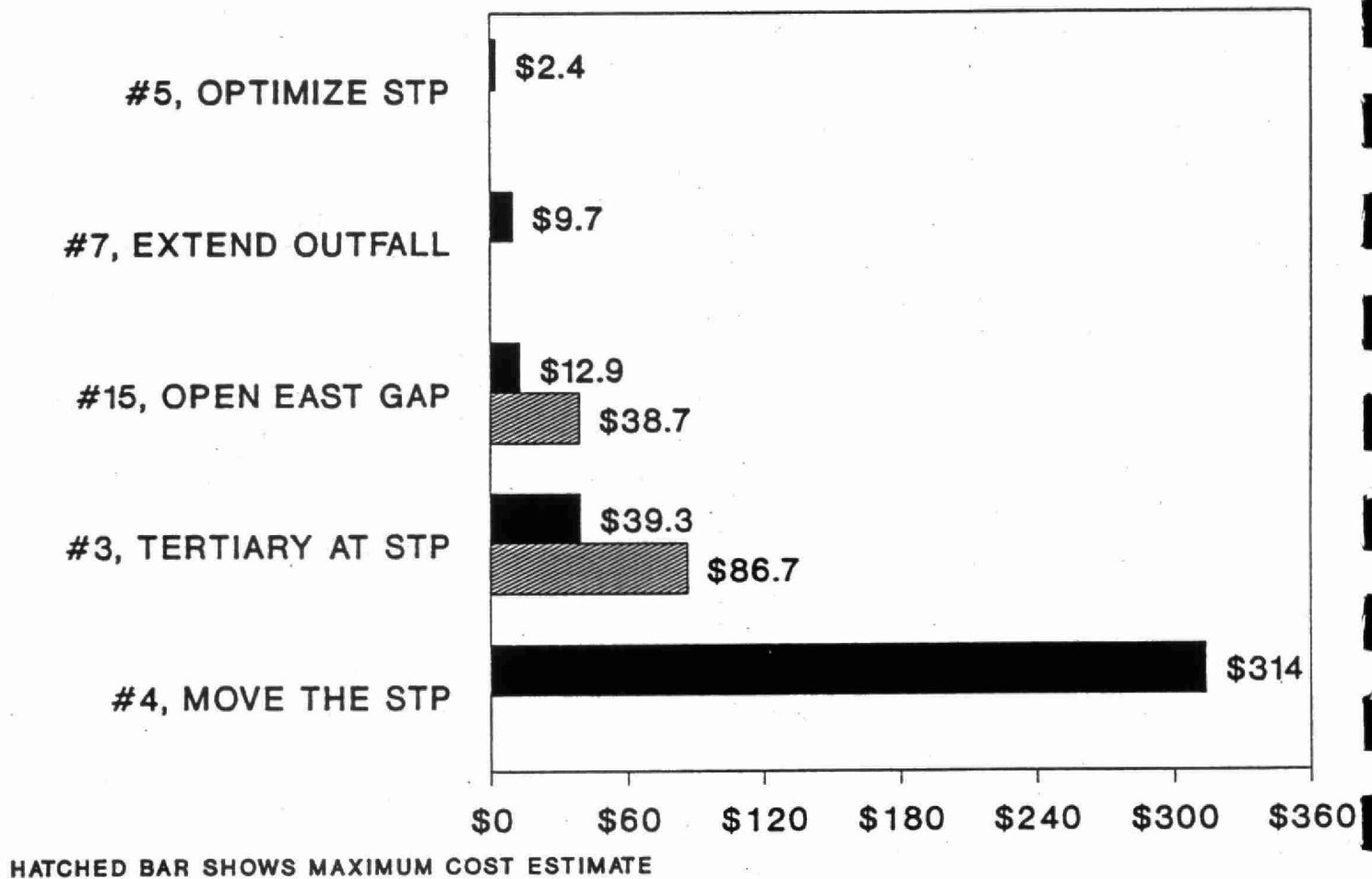
CONTOUR LEVELS

0.00500  
0.01000  
0.0200  
0.0300  
0.0400



A summary of the estimated cost per square meter of harbour restored for several of the remedial options modelled is presented in Figure 4.7.

Figure 4.7. COST PER SQUARE METER OF HARBOUR RESTORED (PHOSPHORUS CONCENTRATIONS BELOW 20 g/L)



## **OPTION 8: New Technologies for Industry**

### **Proposal**

Develop new technology for industries with large flows to the sewage treatment plant in order to eliminate or substantially reduce phosphorus and other contaminants in their effluent.

### **Objectives**

New technologies for industry would result in reduced nutrient and hydraulic load to the STP, thereby assisting the STP in meeting the RAP P load limit.

### **Description**

New technologies for the treatment of industrial waste could include constructed wetlands, rock marshes or solar aquatics. (For elaboration, see Option 6, Incorporate New, Proven Technologies at the STP, above.) Alternatives include rapid infiltration land treatment, subsurface wastewater infiltration systems, and process changes that focus on pollution prevention and water conservation.

**Related projects:** New Technologies at the STP

**Funding:** Industry, potential for grants from Environment Canada and Environment Ontario

### **Responsibility for Implementation:**

New technologies may ultimately be required under MISA. Industry would be responsible for implementation.

**Status:** Future option

## 4.8 REJECTED OPTIONS

*At the delisting strategy workshop, the Collingwood Harbour RAP Team and Public Advisory Committee considered all of the options for remedial action described in Making Choices: A Discussion Paper on Remedial Options. The group decided that several options either were not consistent with the RAP's ecosystem philosophy or would not be effective or necessary in the restoration and maintenance of water quality in Collingwood Harbour. The rejected options are Option 2, Sewage Treatment Plant Detention Pond; Option 4, Move the Sewage Treatment Plant; Option 8, New Technology for Industry; Option 12, Black Ash Creek Detention Pond; Option 15, Increase Exchange; and Option 16, Monitor.*

*There was 100-per-cent consensus on rejecting all of these options, except for Option 15, the discussion of which is described below.*

---

### **OPTION 15: Increase Exchange by Opening an East Gap**

#### **Proposal**

Increase the exchange of harbour water with that of Nottawasaga Bay by opening the harbour's east side.

**IJC Beneficial Uses Addressed:** Eutrophication or Undesirable Algae;  
Degradation of Aesthetics

#### **Objectives**

Increasing exchange with the bay would increase water flow within the harbour, thereby enhancing the flushing of phosphorus and other nutrients out of harbour waters. With less phosphorus in the harbour for a shorter period of time, the possibility of nuisance algal growth would be reduced.

#### **Description**

Water exchange with Nottawasaga Bay would be increased by opening up the east side of the harbour in a structure including six culverts and sluice gates; a pumping station to facilitate flow to and from the harbour may also be installed. Water from the harbour would flow or be pumped into the bay through the opening. If problems with water quality in the bay should occur, pumping could be temporarily halted or the flow could be prevented. Exchange would also be halted if water conditions within the

harbour were to render increased mixing unnecessary, as would be likely during the winter, or if water-quality degradation were to occur due to accidental spills or plant upsets.

**Related Projects:** None.

### **Benefits**

- a) Increasing exchange would improve water quality, particularly in the eastern, confined areas of the harbour. A Rand Model conducted for the RAP found that the area of the harbour's waters with phosphorus concentrations in excess of provincial guidelines would be reduced by a factor 3.9 if an east gap were opened (Figure 4.8).
- b) Increased exchange would improve the mixing characteristics of the harbour and dilute the STP effluent.

**Probable Effectiveness:** High

### **Potential Obstacles to Implementation**

- a) Before increased exchange could be implemented, the effects on water quality in Nottawasaga Bay would have to be fully determined by an environmental assessment.
- b) Even if the research were to show that the option is environmentally acceptable, the condition of the bay's water would have to be monitored routinely for at least one ice-free season to verify model predictions.
- c) Increasing the exchange of water with the bay is a "dilution solution" that moves the problem from one area of the ecosystem to another, and does not benefit the ecosystem as a whole.
- d) Approval of private landowners would be required, particularly if a pumping station were to be installed.
- e) A wetland, which has not been classified, lies directly to the east of Collingwood Harbour.

**Cost:** \$6,345,000, based on installation of a coffer dam. Cost substantially less if coffer dams were determined to be unnecessary.

### **Discussion**

There was some disagreement at the delisting strategy workshop over whether or not to include this option in the delisting strategy.



In support of the option's inclusion, it was argued that if Option 7, Extend the STP Outfall with Diffuser, is in the delisting strategy, then Option 15 should be as well, since both are "dilution solutions." As well, some participants advanced that opening an east gap would produce the same effects as installing tertiary treatment equipment at the STP, but at much less cost. Opening the gap, some argued, was one way of getting the harbour flushed out quickly, effectively reducing phosphorus concentrations--and nuisance algal growth in harbour waters, with little chance of adversely affecting the wetland outside the harbour.

Other participants argued against Option 15's inclusion in the delisting strategy, even though Option 7 involves dilution, because Option 7 has the added benefit of making the STP outfall conform more closely to Environment Ontario requirements; opening an east gap, on the other hand, would be strictly a dilution solution. It was also pointed out that opening an east gap could have an adverse impact on the wetland in Nottawasaga Bay, and that further modelling work to determine that impact would have to be performed before implementation. It was also noted that the possibility of impacts on the wetland would make community approval of the proposal difficult to achieve. As well, some participants remarked that the option would involve the use of CN land, and that CN has not forwarded its plans for future land use. On a more general level, future developments along the eastern side of the harbour may eventually render the gap unusable. It was forwarded that the feasibility of opening an east gap should be reviewed if Option 5, Optimize Operations at the STP, and Option 7 proved to be ineffective in restoring water quality.

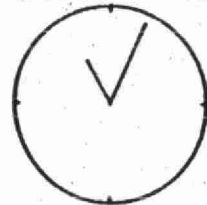
Because opinion was divided, the issue of including Option 15 in the delisting strategy was taken to a vote. **Eleven participants opposed inclusion of Option 15 in the delisting strategy, six supported its inclusion in the strategy as a long-term solution, and one participant abstained.**

As a result of the vote, there was **100-per-cent consensus that the reasons for the difference of opinion on whether Option 15 should be in the strategy would be detailed in the RAP.**

The majority vote was that Option 15 would not be part of the delisting strategy.

**Status:** Not part of delisting strategy.

NOV 21 15001 STEPS



PM

# COLLINGWOOD HARBOUR

EAST GAP NOVEMBER  
TOTAL PHOSPHORUS

400 m  
GRID SCALE

CONTOUR LEVELS

0.00500  
0.01000  
0.0200  
0.0300  
0.0400

WIND  
0.2 M/S

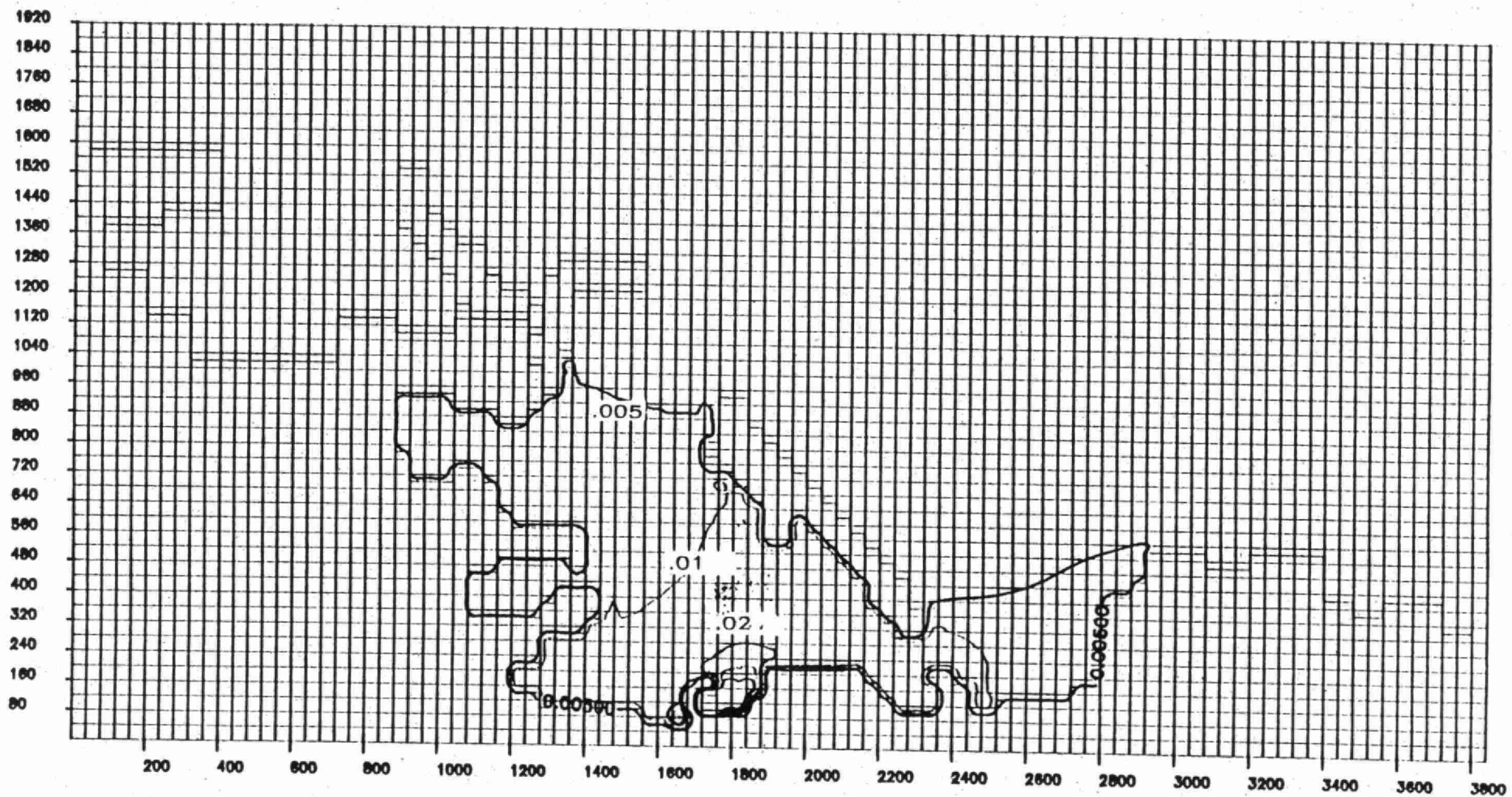


FIGURE 4.1a

## **OPTION 2: Sewage Treatment Plant Detention Pond**

### **Proposal**

Construct a detention pond for rare sewage treatment plant upsets or excessive flows. The pond would receive effluent that the plant was unable to treat and contain it for later treatment.

### **Description**

Unusually heavy rainfall, equipment breakdowns, industrial upsets, seasonal increases in waste production, human error—all of these factors can contribute to a plant upset, in which the STP is not capable of processing all the waste that is sent to it. When upsets occur now, excess waste that the STP cannot immediately treat bypasses the plant and is sent directly into the harbour. Such upsets occur very rarely, but if they were to occur, a detention pond would hold waste water until the plant is ready to treat it. When the conditions causing overload or upset are ameliorated, the waste would be transferred from the detention pond to the STP for treatment. The detention pond would have to be constructed close to the existing sewage treatment facility, probably in Harbourview Park.

### **REASONS FOR OMISSION**

- 1) A detention pond in Harbourview Park would detract from the aesthetic enjoyment of the area.
- 2) The proposed location for the pond is a filled waste-disposal site, a factor that would make excavation extremely difficult.
- 3) With the implementation of Option 5, Optimize Operations at the STP, and Option 7, Extend the STP Outfall with Diffuser, a detention pond would not contribute significantly to the improvement of water quality in the harbour.

## **OPTION 4: Move the Sewage Treatment Plant**

### **Proposal**

Move the entire sewage treatment plant to the east end of Collingwood, with the possibility of using the sale of the STP lands to help offset the cost of building a new plant.

### **Description**

A new plant would require, in addition to the expensive tertiary sewage treatment equipment and the acquisition of land, all new pumping stations and piping, extensive environmental impact assessments (especially for Nottawasaga Bay, where the new plant's outfall would be located), and detailed feasibility studies.

### **REASONS FOR OMISSION**

- 1) Moving the STP is inconsistent with the PAC Use Goal for the harbour as a receiving body of water for the sewage treatment plant.
- 2) The option is technically difficult, requiring massive changes to the existing configuration of sewers and pump stations.
- 3) A new STP would be very costly. Total costs have been estimated at \$65,909,000.
- 4) Other remedial actions in the strategy are sufficient to restore water quality.
- 5) With the outfall in Nottawasaga Bay, any STP upsets could have an impact on adjacent bathing beaches or the Collingwood water intake.

## **OPTION 12: Black Ash Creek Detention Pond**

### **Proposal**

Construct a detention pond and other structures in Black Ash Creek to reduce nutrient and silt loading to the harbour.

### **Description**

The pond would be constructed at the confluence of Black Ash Creek and Taylor Creek, on approximately 30 acres of land. It could include a marsh that would absorb soluble pollutants, and it would have room to allow for storm-water storage. The cost of building such a pond has been estimated at \$3,569,000.

### **REASONS FOR OMISSION**

- 1) The reduction in phosphorus loading to the harbour as a result of a detention pond would be minimal.
- 2) The pond would require regular maintenance and dredging.
- 3) This option is not necessary if pollution prevention activities such as Option 13, Creation of a Buffer Zone Along Black Ash Creek and the Canals, and Option 26, Agricultural Programs, are implemented.
- 3) A detention pond does nothing to control erosion, the source of the problem of silt and phosphorus loading from Black Ash Creek.

## **OPTION 16: Monitor (status quo)**

### **Proposal**

Monitor the harbour to determine whether time will heal the problem or whether remedial options are required.

### **Description**

At present, the environmental condition of the harbour is continually monitored. This option simply calls for the continuation of this action, in conjunction with an ongoing public awareness program.

### **REASONS FOR OMISSION**

Data from monitoring studies conducted from 1989 to 1991 suggest that if no technical options are implemented, any further recovery of water quality in the harbour will be minor.



**V. IMPLEMENTATION STRUCTURE AND PUBLIC INVOLVEMENT IN  
THE COLLINGWOOD HARBOUR RAP**

## **IMPLEMENTATION STRUCTURE AND PUBLIC INVOLVEMENT IN THE COLLINGWOOD HARBOUR RAP**

*The restoration of Collingwood Harbour will require a well-defined implementation structure to ensure that remedial actions are executed in a co-ordinated manner and that beneficial uses are achieved. Several examples of the public's role in implementation exist throughout the Great Lakes Basin. The intent of this proposal is to blend features of existing models into an implementation structure that recognizes the unique interaction among stakeholders in the Collingwood Harbour RAP.*

### **5.1 PUBLIC INVOLVEMENT**

The nature and level of public involvement in implementation will, in large part, depend upon the expectations and preferences of PAC members. The proposed implementation structure should reflect those expectations and preferences.

The public, through the PAC or whatever successor organization is appropriate, can become involved in implementation in several capacities:

- Participation in the implementation of small-scale projects.
- Audit of the restoration effort.
- Public awareness and information management.
- Advocate for funding and political support for implementation.
- Advising implementors of public concerns and priorities.

Two distinct types of structures for achieving the audit and advisory role are the following:

- Citizens participate collectively with agencies and other implementors; or
- there is a separation of functions between the agencies and other organizations, as implementors, and the public, as auditors.

The first structure, described more closely, resembles the current dynamics between the PAC and the RAP Team.

## 5.2 COLLINGWOOD HARBOUR ACTION TEAM

The Collingwood Harbour Action Team (CHAT) would co-ordinate the implementation process and be composed of citizens of Collingwood, federal, provincial and municipal agency representatives, major stakeholders with implementation responsibilities, and the chairpersons of subcommittees reporting to the team.

The functions of CHAT would include:

- Defining and co-ordinating programs to address RAP recommendations.
- Identifying responsibility for achieving preferred remedial action.
- Being kept informed of the results of any negotiations on the mechanisms for implementing and funding the preferred remedial action.
- Assisting in maintaining the RAP as a continuous priority for the implementors.
- Monitoring implementation and tracking progress.
- Developing consensus on revisions or modifications to the RAP.
- Convening and directing subcommittees as required.
- Reporting on progress during RAP implementation, and on restoration of beneficial uses

The CHAT would have approximately 14 members, including, for example, the director of Environment Ontario's Central Region or designate; representatives from Environment Canada, Environment Ontario, the Ontario Ministry of Natural Resources, Collingwood Town Council, the Collingwood Sewage Treatment Plant, the Collingwood PUC; coastline development; the Collingwood Harbour RAP co-ordinator; the PAC chairperson, and subcommittee chairpersons. The CHAT could also include representatives from education and commerce sectors, as well as other provincial and federal agencies.

It is proposed that COA agencies would provide resources to support RAP implementation and core aspects of continuing public involvement. The Action Team would be chaired by the former PAC chairperson and RAP co-ordinator, issue annual reports and communicate progress to the agencies, to administrations of the Canada-Ontario Agreement and to the public.

### **The Public Accountability Committee: a new orientation for the Public Advisory Committee**

The new PAC would serve as the local "watchdog" group with which the subcommittees and CHAT would report progress on RAP implementation. It has been proposed that the new PAC be chaired by Mr. J. Kilgour, and membership would be comprised of all interested participants of PAC, and would could expand several aspects of PAC's current roles including:

- auditing the implementation of the RAP
- reviewing the results of environmental monitoring and surveillance
- providing advice on priorities and directions to the CHAT

- reviewing CHAT documentation including plan revisions and updates of remedial actions.

Subcommittees would be formed to co-ordinate implementation of specific options. Examples include:

#### **5.2 -1 Monitoring and Surveillance Subcommittee (formerly the RAP Team):**

The Monitoring and Surveillance Subcommittee would be responsible for environmental monitoring and surveillance, would track implementation of remedial actions and evaluate their effectiveness, and make recommendations for modifications to the plan. This subcommittee RAP Team would report to the chairpersons of the CHAT through the RAP Coordinator.

Membership includes MNR (Alex Smith), MOE (Micheal D'Andrea), EC (Lori Reynolds), MOE Central Region (Wes Lammers), and RAP Coordinator Gail Krantzberg (MOE)

#### **5.2 -2 The Public Awareness Subcommittee (PASC)**

This committee's mandate and membership could be expanded, with the options for the PASC to incorporate. The public education/awareness aspect of Harbour restoration has emerged as a significant part of the Collingwood Harbour RAP's public involvement program, with the PAC taking an active role in communicating with the general public and local public organizations. It is expected that this task will continue as a priority during implementation. The role for the public can be formal or informal. The public may establish separate and fully independent organizations, such as incorporated charitable foundations with autonomous funding, or have their activity co-ordinated through government sponsored committees that would be subject to government spending priorities.

Membership includes Senior League of Collingwood (Greta McGillivray), High School students (Jason Brearley), Education (Dick Edwards/Jim Kilgour), CHAT Cochairpersons (Ed Houghton, Gail Krantzberg), and is cochaired by Don Jaques (Canadian Mist Distillers) and Leone Hall (citizen-at-large). Other members are being sought.

Current projects include ENVIROPARK (under construction), the Purple Loosestrife Control Program, RAP Rap Articles, Mariner Awareness Programs, the Collingwood Harbour RAP Video, and participation in organization of Harbour Day 92.

### **5.2 -3 The Sediment Removal Demonstration Team (SRDT)**

Members include Environment Canada (Ian Orchard), Transport Canada (Carmelita Olivotto), CSL (Lee Martin), the Terminals (Sandra Rupert), the Town of Collingwood (Joe Sheffer), the CHAT Co-chairpersons (Ed Houghton, Gail Krantzberg). The mandate of the SRDT is to participate in a co-operative effort to test innovative sediment removal technologies in Collingwood Harbour, and to remove sediment from the CSL launch basin and from the east end of the harbour. The SRDT is chaired by the RAP co-ordinator (Gail Krantzberg).

### **5.2 -4 The Sewage Treatment Plant Steering Committee**

Members include the Town Engineer (Ken Astill), Environmental Engineer (Don Green), Environment Ontario (Tony Ho/R. Manoharan/M. D'Andrea), Environment Canada, CH2MHILL (consultants) the CHAT Cochairpersons (Gail Krantzberg, Ed Houghton), MOE Central Region (Ian Gray). Don Green is the Town Contact person on this committee.

The STP Steering Committee's first task was to assist in the development of the computerized process audit completed in November, 1991. The committee continues to develop implementation strategies for options involving the STP. As of July 1992, the committee is received funding commitments from MOE and Environment Canada in order to commence implementation of an enhanced phosphorus removal system at the STP. This remedial action has been assigned the highest priority in the Stage 2 Document, and the Town has agreed to funding the project with the cooperation of agency participants.

### **5.2 -5 The Fish and Wildlife Restoration Subcommittee**

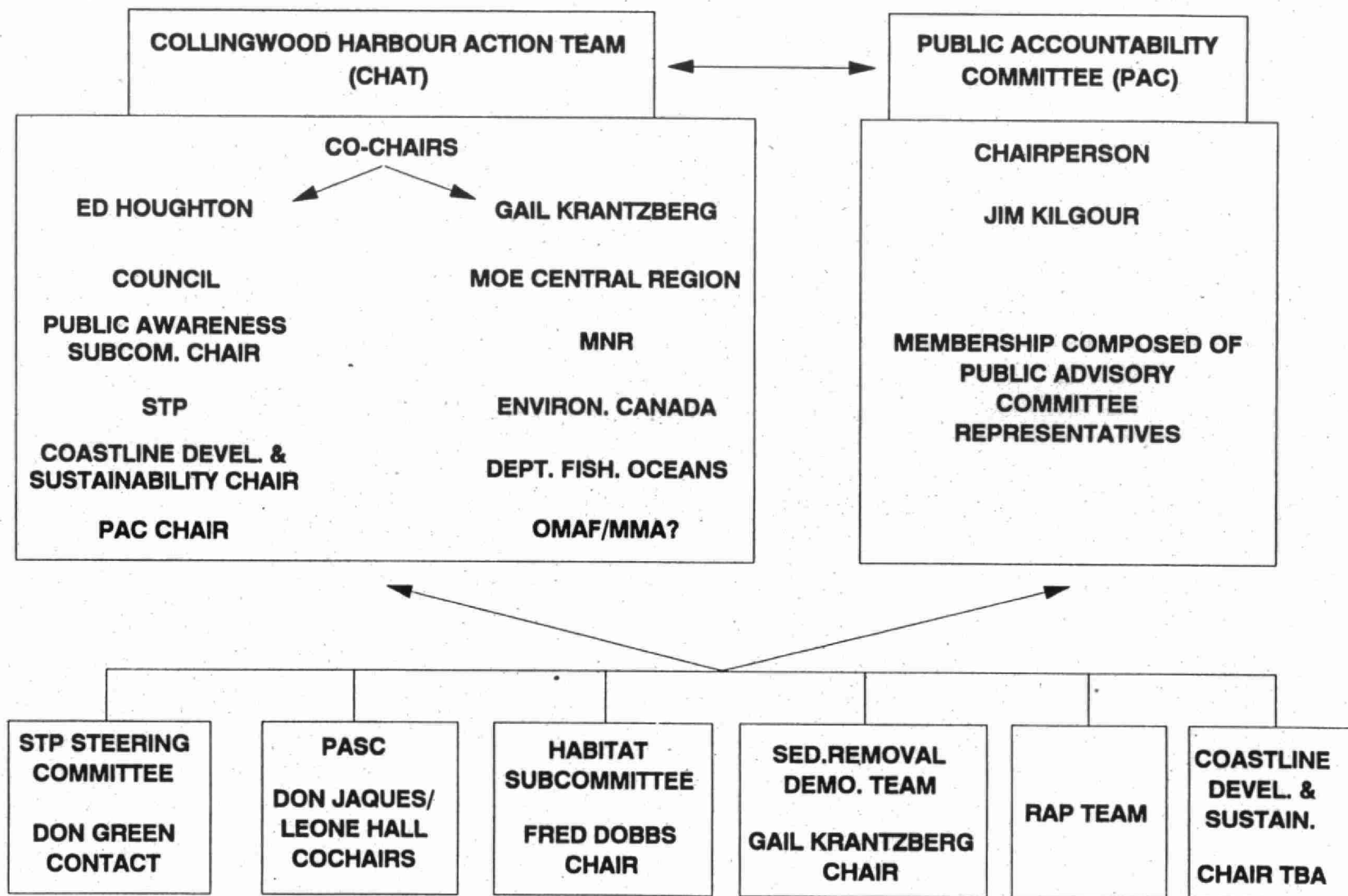
In the process of forming, this subcommittee is being established to monitor protection of existing habitat and to develop a strategy for habitat rehabilitation within the harbour and in the Black Ash Creek watershed. Members include the MNR (Alex Smith), Nottawasaga Valley Conservation Authority (Wayne Wilson) Georgian Triangle Anglers Association (Carl Eichenberger), Rotary Club, Department of Parks Recreation and Culture/Georgian Trail (Greta McGillivray), Naturalist Club (Jack Poste), CHAT Cochairpersons (Gail Krantzberg, Ed Houghton), CN Realty (Laurie Aaron), Department of Fisheries and Oceans (Tentative), Education (Dick Edwards/Jim Kilgour), and is chaired by Fed Dobbs (contract position with MNR/NVCA). The first priority for this subcommittee is to implement the Black Ash Creek Project, designed to control erosion and sediment load to the harbour, and enhance fish habitat in conjunction with flood control measures being undertaken by the Conservation Authority. A complete fish inventory of the harbour, the wetland and the Creek will establish baseline conditions prior to rehabilitation efforts.

## 5.2 -6 Coastline Development and Sustainability

Not yet in existence, a subcommittee is being formed to assist in coordinating waterfront development in a manner consistent with protection and enhancement of the Collingwood Harbour Ecosystem. Potential members include the Town Planner (Nancy Farrer), CSL (Lee Martin), CN Realty (Laurie Aaron), Kaufmanns (not designated), Cranberry Inn (not designated), MNR (Alex Smith), MOE, DFO (not designated), CHAT Cochairpersons, and local citizens. An organizational meeting to draft the terms of reference for this subcommittee is scheduled for the summer of 1992.

*Subcommittees would report to the CHAT. Chairpersons on these subcommittees would become members of the CHAT. The CHAT fundamentally represents the implementors and coordinators of the implementation subcommittees. CHAT will require one or two external individuals to assist in organizing the actions of the subcommittees and reporting on progress on implementation.*





**APPROACHES TO FUNDING THE IMPLEMENTATION  
OF THE COLLINGWOOD HARBOUR RAP**

The Collingwood Harbour RAP is at a stage where the approximate costs for clean-up are known, but the precise financial arrangements for implementation require attention. For example, what are the possible cost-sharing arrangements; where will the required money come from; and how able or willing is the community to pay for remediation? This section will explore the potential funding combinations and the implications to the community, by comparing RAP costs with other forms of taxation and municipal spending. The principles of beneficiary and polluter pay will be examined, as will the anticipated benefits from RAP implementation.

### **6.1 The cost of cleanup:**

Figure 6.1 highlights the potential cost sharing arrangements for the RAP options to be implemented as part of the short-term strategy. For example, the total cost to implement option 5 (STP Optimization) is estimated at approximately \$500,000 to \$1.1 million, or \$100,000 to \$222,000 over 5 years. This option has received a grant of 33% of the project cost from the Ontario Ministry of the Environment and an equivalent grant from the federal Great Lakes Cleanup fund. The remainder of the cost for option 5 - (\$40,000 per year over 5 years using an estimate of \$600,000 total project cost) - is being provided by the local municipality. This translates into a total per capita cost<sup>4</sup> of \$11.50, or \$2.25 per person per year over 5 years.

With respect to option 7 (Relocate STP Outfall), provincial grants are available from other provincial funding programs, but the exact contribution can only be obtained after formal submission of the details of the project to the relevant program. Assuming the entire cost of option 7 is incurred by the municipality, the annual cost for implementation would be \$424,600 with the per capita cost for implementation a maximum of \$25 per year. With 33% provincial funding assistance, the per capita cost per year would be approximately \$17.

The costs associated with funding option 11 (Habitat Rehabilitation) would be associated with waterfront developers within the harbour, absorbed into the cost of extending the STP outfall, or reflected in the costs associated with the Black Ash Creek Rehabilitation Project. As participants in the project are identified, the cost to the municipality will likely be negligible.

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<sup>4</sup>Permanent population of 13,551, seasonal population of 4,200; Source: Town of Collingwood

Figure 6.1: Cost of Implementing the Preferred Short-Term Remedial Options

| <b>ESTIMATED COST</b>                 | <b>OPTION 5:<br/>Optimize<br/>operations at<br/>the STP</b> | <b>OPTION 7:<br/>Relocate the<br/>current STP<br/>outfall with a<br/>diffuser 500<br/>metres off shore</b> | <b>OPTION 11:<br/>Rehabilitate<br/>areas of the<br/>harbour to<br/>provide fish and<br/>wildlife habitat</b> |
|---------------------------------------|---|--|--|
| TOTAL COST                            | \$600,000   | \$2,123,000  | \$2,286,000  |
| COST TO<br>MUNICIPALITY               | \$200,000 <sup>1</sup>                                      | \$1,415,333 <sup>2</sup>   | Dependent on<br>activity <sup>3</sup>  |
| TOTAL COST PER<br>CAPITA <sup>4</sup> | \$11.27   | \$104.45   | unknown  |
| COST PER CAPITA<br>PER YEAR           | \$2.25  | \$20.88  | unknown  |

<sup>1</sup>assumes one third funding from MOE and one third funding from the Great Lakes Cleanup Fund

<sup>2</sup>assumes one-third funding from MOE

<sup>3</sup>assumes majority of cost to be associated with rehabilitation in conjunction with future development

<sup>4</sup>permanent population 13,551, seasonal population 4,200 Source: Town of Collingwood

In the long-term, costs for implementation of options 1, 3 and 9 are presented over a 10 year time frame. The total cost for implementing these three options is estimated at \$38 million<sup>1</sup>. If the industrial related options (1 and 9) are implemented, then cost to industry would be approximately \$2.36 million per year for ten years.

If full provincial funding of 33.33% for option 3 (Tertiary Treatment at the STP) is obtained, the the associated cos would be \$1.5 Million per annum over 10 years. This translates into approximately \$89 per person per year for 10 years. This cost could be saved if the short-term options are successful in the restoration of water quality in support of the beneficial uses.

## **6.2 RAP Costs in the Context of Municipal Spending Trends**

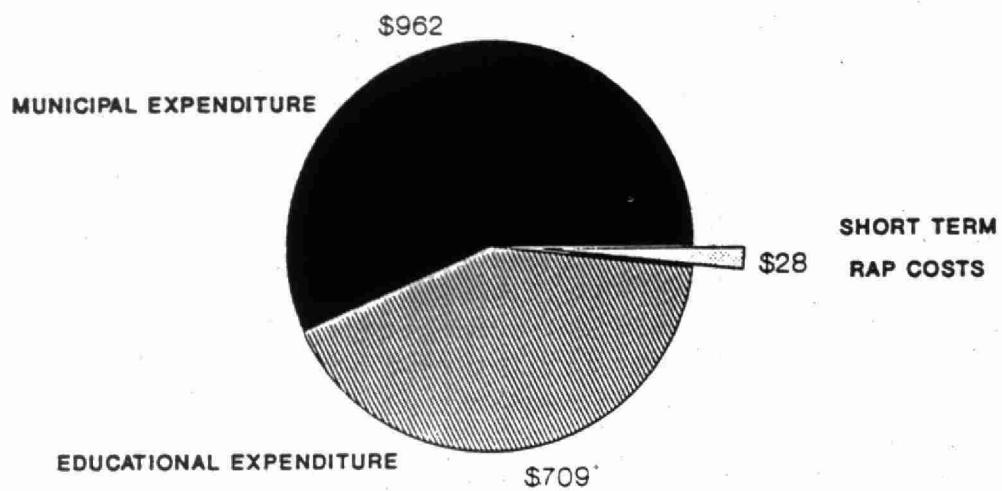
In the past 10 years, there have been measurable increases in spending, based on the Town of Collingwood's budget. The 1991 budgeted expenditure, per person, is 60% higher than in 1987 and 98% higher than the 1984 budget. After adjustment for inflation, these increases from 1984-1991 were still 52%. For the purpose of comparison, the affordability of the RAP costs can be assessed in relation to the municipal expenditures.

Local government agencies spend more than \$28 million per year, or approximately \$1610 per permanent and seasonal resident per year (Source: Town of Collingwood). Compared to this total consolidated municipal expenditure, the cost to restore the health of the Harbour if the short term options are implemented would be approximately 1.6% of this expenditure. If the long-term options are implemented, the cost would be approximately 5.5% of the consolidated municipal expenditure, excluding the costs to industry.

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<sup>1</sup>using the upper estimate of \$15.1 Million for tertiary treatment at the STP

Figure 6.2: RAP Costs in Relation to Municipal Per Capita Expenditures



SOURCE: TOWN OF COLLINGWOOD BUDGET 1991



### 6.3 Beneficiary/Polluter Pays Principle

The normal route of financing municipal expenditures is through collecting property taxes. While the town receives funds from other sources, property taxes fundamentally define the level of spending that occurs.

Over the 16 year period from 1974 to 1990, property taxation has increased about 3% per year more than the average inflation level. Taxation revenue in the Town of Collingwood in 1991 amounted to approximately \$1,187 per capita for permanent and seasonal residents. To recover the annual short-term RAP costs ranging from the lowest estimate with full provincial funding of up to 33.33% (\$19) to the highest estimates with limited provincial funding (\$35), an increase of approximately 1 to 2% taxation would be required. *This assumes that there are presently no municipal funds that would otherwise be allocated to the options recommended in the RAP. The activities associated with the Waterfront Master Plan and other Town programs could be complimentary to implementation of the RAP preferred options.*

An alternative, more equitable and sustainable approach that puts less burden on tax increases in the increased use of user fees, such as water rates. Full cost recovery does not constitute an economic cost, nor will the Public Utilities Commission benefit from the additional revenue, however, the savings in capital and current expenditures may be used by the PUC for upgrading water services. The Town of Collingwood's average household water consumption level is 40 m<sup>3</sup>, compared to the provincial average of 35 m<sup>3</sup> per month. The Town is now metered, the water charge of \$0.288 m<sup>3</sup> or the monthly average charge \$12.42 is lower than the provincial average for constant rate structures, of \$18 per household per month. The plans to increase water rates in the near future to help offset costs of building a water filtration plant should also encourage water conservation.

In the case of sewage, the 1991 budget shows spending of \$363,800 on sanitary and storm sewers, and \$2,019,866 on the STP and pumping stations, for a sum of almost \$2.4 Million. Unlike water, sewage is recovered through general levies, rather than user fees or a combination of the two. The average household sewer charge in Collingwood is \$14.06 per month. A sewer surcharge based on mill rates does not reward consumers who make an effort to conserve water. Incentives to conserve could be driven by user payment for sewage services. Plans are underway to impose a sewer use surcharge in Collingwood.

#### **6.4 The Benefits of Remediation and Willingness to Pay**

The types and magnitude of potential benefits for the Collingwood area as a result of RAP-related activities are substantial. While interconnected, they can be grouped into environmental, economic and social gains. As documented in the RAP, environmental benefits resulting from implementing of the plan include:

- reduced nutrient enrichment and control of algal growth
- improved water clarity and aesthetics
- maintenance of the bacterial objective for body contact recreation
- protection and enhancement of fish and wildlife habitat quality and quantity
- reduced contamination of sediment and biota

In terms of social, or intrinsic benefits, Apogee (1991) has estimated a value associated with obtaining aesthetically pleasing water as \$15 per household, or \$70,000 annually (in 1987 dollars), if applied to the Town of Collingwood. This is the value associated solely with the "satisfaction" of residents knowing that their harbour water is visually pleasing, regardless of whether they "use" the resource, and is based on the "Willingness to Pay" for environmental restoration. Over a then year period, the benefit associated with this one social value would total close to \$1 Million.

Given the considerable level of uncertainty in expressing social values in economic terms, it is important to highlight the many other social benefits that will accrue from implementing the RAP, including:

- retaining natural ecosystems for future generations
- enhanced comfort and satisfaction by the business sector regarding the long-term future of investment and ability to attract workers
- residents feeling better about the town in which they live
- satisfaction that the ecosystem is inherently safe, clean and productive, even if the resources are not directly used

Acknowledging that water conservation can result in dramatic water quality improvement, water conservation initiatives will provide additional benefits including:

- reduced water supply costs for all water users, estimated savings of \$125 per household per annum
- reduced pumping costs for the PUC
- reduced wastewater treatment costs for the municipality and industry
- reduced energy costs for pumping and heating water to result in savings for all water users
- deferral or elimination of the need for STP expansion, freeing up money to apply to other remedial actions

Currently, the standard multiplier used by Ontario Ministry of the Environment, Fiscal Planning and Assessment Branch predicts that 11 direct and 22 indirect jobs are created for every \$1 Million capital expenditure. One-time jobs generated during RAP implementation include:

- approximately 30 direct and 60 indirect jobs for STP optimization and relocation of the STP outfall
- approximately 330 direct and 660 indirect jobs if the long-term options are implemented
- approximately 15 direct and 30 indirect jobs if this multiplier is applied to the construction of ENVIROPARK and capital costs for the Black Ash Creek Rehabilitation Project

Additional income generated for nonresidential construction, based on a multiplier of 0.9<sup>1</sup> would result in:

- \$2.4 Million associated with implementing STP optimization and relocating the STP outfall
- \$44.7 Million associated with implementing the long-term options
- \$1.3 Million associated with ENVIROPARK and the Black Ash Creek Rehabilitation Project

Some estimate of the actual extent of more tangible economic benefits of the RAP can be obtained from the Town's recent Waterfront development plan. The plan recommended a number of ventures including the creation of additional parkland, trail systems, a marina, residential/commercial facilities, increased access to the harbour, and the development of the CSL and CN lands. If these kinds of initiatives proceed, the economic benefits that the municipality could realize include:

- increased tourism expenditures of \$4.6 to \$6.7 million per annum
- increased sales in the local economy of \$6.9 to \$10.3 million
- additional municipal tax revenues of \$200,000 per annum due to increased tourism, and another \$1.6 to \$2.2 million per year in property taxes from the CSL development
- private sector investment in the community of \$250 million
- further diversification of the local economic base through the strengthening of the local tourist industry

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<sup>1</sup>Marshall, Macklin Managham Ltd: Assessment of the proposed remedial action plan for Hamilton Harbour. Prepared for the Ontario Ministry of Environment. April 1988.

The Centre for the Great Lakes (1991) waterfront development survey identified that access to outdoor recreation and clean water and air are among the most important factors businesses consider when choosing where to locate and live. According to their report, the success of the region's waterfront redevelopment efforts is inextricably linked to progress in restoring the Great Lakes. Effective urban waterfront renewal plans must meet a critical precondition - clean water.

Some of the benefits to be derived from Collingwood's Waterfront Master Plan are linked to the RAP. The success of the Collingwood Waterfront Development Plan is very much contingent to improvements in water quality and environmental conditions, since poor environment quality can be a barrier to the use and development of the waterfront. Attracting and sustaining the visitorship to the area rests, to some degree, on the success of the restoration of the harbour. In turn, some of the benefits outlined above are directly and indirectly the result of implementing the RAP. For the purpose of illustration only, if 1% of the projected economic benefits from Collingwood's Waterfront Plan could be attributed to the RAP, then the benefits would heavily outweigh the Town's portion of the total cost of implementing all the short-term options.

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## **APPENDIX 1**

### **The Public Involvement Program for the Collingwood Harbour Remedial Action Plan**

Report on Activities  
November 1987 -- Summer 1992

#### Introduction

The Collingwood Harbour Remedial Action Plan has sought to involve the public in all stages of its development. This report documents chronologically from November 1987 to present the major opportunities for public involvement such as public meetings, efforts to provide the public with information on the RAP, newspaper coverage and all meetings of the Public Advisory Committee and its subcommittee. Minutes for all PAC, subcommittee and public meetings are can be viewed at the Collingwood Public Library. All meetings of the PAC are open to the public. Because of Collingwood's relatively small size, the RAP newsletter is distributed to all residents and buisnesses serviced by the Collingwood Post Office.

- November, 1987      RAP public involvement program planning begins.
- November, 1987      Meeting with stakeholders concerning the Public Involvement Program  
Facilitator (Tom Green) meets with Town Engineer Ken Astill, councillor McKenzie and local citizen Karen Jantzi to review plans for the RAP and the Public Involvement Program.
- December 11, 1987   Letter to the Mayor of Collingwood  
Reviews the RAP process and describes the public involvement program, explaining the major steps involved.
- December 2, 1987   "MOE to Begin Education Program"  
Enterprise-Bulletin reports on meeting between facilitator and Town Engineer, and on Ministry's plans for a public involvement program.

#### **1988**

- January 1988      Meeting with stakeholders concerning the Public Involvement Program  
Facilitator meets with citizen Karen Jantzi, with Director of Parks and Recreation, and high school teachers.
- January 27, 1988   Meeting with Mayor  
Bob Shaw, MOE Central Region and the facilitator meet with the

mayor concerning the public involvement program. Details of program are explained, misunderstandings cleared up. Mayor extends the town's cooperation and support.

- February 8, 1988      Media Release Issued  
Media release is issued announcing the RAP and the public involvement program.
- February 9, 1988      Letter to stakeholders  
Letter is sent to individuals representing interests in the harbour outlining the RAP, the Public Involvement Program, and informing them that the facilitator will contact them
- Feb. 17, 1988          "Ministry to Inform Council About Condition of Collingwood Harbour"  
Enterprise-Bulletin reports on upcoming presentation to town council by the RAP team.
- Feb. 18, 1988          Meeting with stakeholders  
Facilitator meets individually with 7 stakeholders to explain RAP, public involvement program, and to canvass their concerns/objectives for the harbour.
- March 8/9, 1988        Meeting with stakeholders  
Facilitator meets with other stakeholders
- March 22, 1988        RAP team presents to Town Council  
RAP team presents environmental information to the Town Council, outlines RAP and public involvement program, and shows RAP video. Meeting is covered by McLean Hunter cable TV, and RAP video rebroadcast to subscribers.
- March 30, 1988        "Collingwood Harbour: Here's Your Chance to Express Concerns"  
Enterprise-Bulletin reports on meeting with Town Council and upcoming public forum.
- April 1988              Issue #1 RAP Newsletter  
This newsletter was distributed to all residents and businesses of Collingwood, introducing the RAP and announcing the Public Forum on April 12.
- April 6, 1988          "You Should Not Miss this Meeting"  
Editorial in the Enterprise-Bulletin urges residents to attend the Public Meeting on April 12.
- April 12, 1988        High School Students Act As PAC Members  
80 students from Collingwood Collegiate Institute were involved in

mock public advisory committee meetings. Each student represented a different interest (shipyard, town council, environmentalist...) and the committee developed use goals for the harbour. Students experienced the complex decisions that must be made for the harbour.

April 12, 1988

**Public Forum: Open House and Public Meeting**

The public forum was divided into two parts: an open house from 6:30 to 7:30 and a public meeting from 7:30 to 9:30.

Open House: The Collingwood RAP display, an aerial blow-up of the harbour and IJC displays of other areas of concern were featured. RAP team members circulated amongst the public, answering questions. By 7:30 over 65 people had registered and the public meeting was able to start.

Public Meeting: The RAP team was introduced, and the Collingwood RAP video was then viewed. The presentations were as follows: RAP process; sediments and the confined disposal facility; public consultation; and the homeowner's responsibility.

Summer 1988

**RAP Display at Town Library**

The RAP display was at the town library all summer, providing basic information about the RAP and providing a number to contact the RAP team.

August, 1988

**Harbour Day Poster**

Harbour Day is announced to the community with a widely distributed RAP poster displayed in storefronts.

September, 1988

**RAP Newsletter Issue #2**

Information on the RAP; announcement of Harbour Day

Sept. 10, 1988

**Harbour Day**

An information event involving other organizations with an interest in the harbour, including harbour tours and environmental games for children. Over three hundred residents attend.

Nov. 15, 1988

"Heavy contamination of Collingwood Harbour may stall development"

Globe and Mail article reports on condition of Collingwood sediments. Much of the article is inaccurate.

Nov. 19, 1988

"Toronto Story Misrepresents Extent of Harbour Contamination"

Enterprise-Bulletin reports on inaccuracies contained in the Globe and Mail article of November 15.

- Nov. 23, 1988 "High bacteria levels in harbor worry Collingwood mayor-elect"  
Toronto Star article reports on bacteria levels in harbour, questioning why warnings against swimming were not posted (the harbour does not have any designated swimming areas).
- Nov. 25, 1988 First Meeting of the Public Advisory Committee  
PAC introduced to the RAP, information on current environmental conditions, Terms of Reference and Principles developed; draft use goals developed
- Nov. 30, 1988 "Harbour Committee Says: Keep the Industrial Recreational Mix"  
Enterprise-Bulletin reports on the first PAC meeting and the objectives of the RAP.
- Dec. 21, 1988 "Harbour Will Continue to Be Monitored in 1989"  
Enterprise-Bulletin reports on monitoring plans for 1989.
- 1989**
- Winter 1989 "Saving the Great Lakes"  
Nature Canada examines the Great Lakes, focusing on the Collingwood RAP
- January 1989 RAP Newsletter Issue #3  
Newsletter announces draft use goals and Public Meeting on January 17.
- January 14, 1989 "Future of Harbor is Public Meeting Focus"  
Enterprise-Bulletin announces upcoming public meeting; editorial urges participation.
- January 17, 1989 Public Meeting: Use Goals for Collingwood Harbour  
The uses and goals developed by the PAC are reviewed and accepted at the public meeting.
- January 20, 1989 Second meeting of the Public Advisory Committee  
The use goals were finalized and adopted, Stage 1 report reviewed, RAP implementation discussed.
- January 21, 1989 "Planning for Collingwood Harbour into the 1990s"  
Enterprise-Bulletin reports on public meeting
- April 28, 1989 Third meeting of the Public Advisory Committee  
Evaluation criteria for remedial options developed, monitoring program reviewed, chairperson appointed.
- April 28, 1989 PAC writes to Federal Minister of the Environment concerning

funding for RAPs

- May 3, 1989 "June Testing Set For Town Harbour"  
Enterprise-Bulletin reports on PAC meeting
- June 3, 1989 Arbour Day: RAP team represented; RAP display mounted; fact sheets distributed
- June 27, 1989 Beaver Caper: RAP team represented; RAP display mounted; fact sheets distributed
- Aug. 11, 12, 1989 Summerfest: RAP team represented; RAP display mounted; fact sheets distributed at both sidewalk sale downtown and at Sunset Point. Desired uses were solicited from participants and results reported to the PAC.
- Aug. 26, 1989 "Water Quality Better, Says MOE official"  
Enterprise-Bulletin reports on summer 1989 water quality data.
- September 1, 1989 Collingwood Day at the CNE: RAP team represented; RAP display mounted; fact sheets distributed.
- Sept. 19, 1989 Technical meeting  
RAP team, PAC members with specialized technical background meet to develop remedial options.
- Sept. 22, 1989 Fourth meeting of the Public Advisory Committee  
Preliminary remedial options reviewed and public involvement discussed.
- Sept. 23, 1989 PAC representative attends workshop concerning a citizen's agenda for Lake Huron.
- Sept. 30, 1989 "Collingwood Harbour Getting Cleaner, Better"  
Enterprise-Bulletin reports on PAC meeting.
- October 14, 1989 "Federal Allocation May Help Harbor"  
Enterprise-Bulletin reports on the \$125 million federal government allocation for Great Lakes clean-up.
- 1990**
- February 6, 1990 Directory of Relevant Public Education Materials for Collingwood RAP assembled for PAC and Awareness subcommittee by facilitator.
- February 8, 1990 Media Strategy Developed

- PAC Chairperson and RAP Coordinator meet with local media to prepare strategy for future media coverage.
- February 9, 1990 Fifth meeting of the Public Advisory Committee  
Public Awareness strategy reviewed; Public Awareness subcommittee struck to implement public awareness activities, one goal revised.
- Feb. 14, 1990 "Collingwood Harbour RAP Water Quality Sees Algae Reduction"  
Enterprise-Bulletin reports on PAC meeting
- Feb. 27, 1990 Black Ash Creek Siltation  
PAC writes to Collingwood Council to request consideration of silt trapping measures while flood control measures are implemented at Black Ash Creek.
- March 8, 1990 Gas Pump Safety Precautions at Lighthouse Point Development  
PAC chairperson and education representative write to Lighthouse Point Development regarding precautions to be taken at marina; meeting is arranged and PAC's environmental concerns are taken into account and precautions developed.
- March 9, 1990 First meeting of the Public Awareness Sub-Committee
- March 21, 1990 Talk show on CKCB radio on the RAP with RAP coordinator and PAC chairperson
- March 29, 1990 Second meeting of the Public Awareness Sub-Committee
- March 30/31, 1990 Science Fair features RAP display
- April 6, 1990 CN Realty's Participation  
RAP coordinator at the request of the PAC writes to CN Realty to seek their involvement in the RAP given their major property interests in the harbour.
- April 20, 1990 Sixth meeting of the Public Advisory Committee.  
Updates on RAP activities: monitoring, STP, harbour computer model, Black Ash Creek, water conservation, avoiding fuel spillage.
- June, 1990 RAP signs mounted around Harbour  
Four signs identifying that a RAP is underway "Working together for a Clean harbour" are mounted at public access points to the harbour and provide a telephone number for people to call to contact the coordinator.



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| June 1, 1990    | Local resident Josephine Balloi hired to assist facilitator to make the RAP/PAC more accessible to local residents.  |
| June 8/9, 1990  | United Nations Environment Fair (Collingwood): RAP team represented, RAP display mounted, fact sheets distributed.   |
| June 14, 1990   | Collingwood Council asked to declare August 25, 1990 "Harbour Day"   |
| June 21, 1990   | Action on fuel spill into harbour<br>PAC members contact RAP coordinator concerning fuel spill of 80 litres on June 12, 1990. RAP coordinator seeks assistance of the Spills Action Centre to ensure Cranberry Marina develops spills response plan. |
| July 16, 1990   | Federal Great Lakes Clean-up Fund supports Enviropark.<br>The fund announced \$17,000 funding for the RAP Enviropark.  |
| July 26, 1990   | Third meeting of the Public Awareness Sub-Committee  |
| July 27, 1990   | Seventh meeting of the Public Advisory Committee<br>Updates on RAP: STP, agriculture programs, and the detention pond for Black Ash creek. Members received draft remedial options document.   |
| August 1, 1990  | "Water in Collingwood Just Keeps Getting Better, RAP"<br>Enterprise-Bulletin reports on PAC Meeting  |
| August 13, 1990 | Description of Harbour Day sent to all Collingwood Media   |
| August 19, 1990 | "Collingwood Harbour Day"<br>Collingwood Connection announces Harbour Day  |
| August 22, 1990 | "Harbour Day 1990 Set for Saturday"<br>Enterprise-Bulletin announces Harbour Day; "Come Celebrate Harbour Day" notice sponsored by local merchants promotes Harbour Day.   |
| August 25, 1990 | Collingwood Harbour Day:<br>Over 400 residents and visitors participate in the second harbour day and learn about the RAP and harbour water quality.   |
| August 25, 1990 | CKCB Broadcasts from Harbour Day site information concerning the RAP   |
| August 29, 1990 | "Harbour Day Message Clear, Refreshing"  |

- Enterprise-Bulletin article reports on the success of the 2nd harbour day.
- Sept. 10, 1990 RAP coordinators meet in Collingwood  
RAP coordinators from the 17 areas of concern in Ontario hold meeting in Collingwood, welcomed by deputy-reeve Ray Barker and members of the PAC. Members of the PAC join RAP coordinators for tour of harbour and discussions on RAPs.
- Sept. 11, 1990 Special Meeting of the Public Advisory Committee:  
The Draft Remedial Options Document was considered by the PAC and revised.
- Sept. 15, 1990 "PAC Examines Options for Collingwood Harbour"  
Enterprise-Bulletin reports on special meeting reviewing options
- Sept. 19, 1990 R.A.P. Rap "Let's Pyramid"  
Public Awareness Sub-committee's first R.A.P. Rap article outlines how this column in the Enterprise-Bulletin will be used to generate greater awareness about the RAP.
- October, 1990 CCI Students Monitor Harbour Water Quality
- October 1/2, 1990 Presentation to students  
The RAP coordinator and the PAC chair make a presentation on the RAP to students from Sir Wilfred Laurier University and Collingwood Collegiate Institute.
- October 3, 1990 Fourth meeting of the Public Awareness Sub-Committee
- October 24, 1990 R.A.P. Rap Article: "Harbour has Algae Problem"
- October 26, 1990 Eighth meeting of the Public Advisory Committee  
PAC updated on shoreline masterplans, the STP, RAP Enviro-park, remedial options document further revised, grey water discussed.
- November 3, 1990 "Grey Water Poses Risk in Collingwood Harbour"  
Enterprise-Bulletin reports on PAC meeting and the problem of grey water in the harbour.
- Nove. 14, 1990 "Pledge Helps Enviropark"  
Enterprise-Bulletin reports that \$20,000 for Enviropark will come from Todd Brooker Ski Challenge.
- Nov. 15, 1990 Enviropark Funding  
Todd Brooker Ski Challenge coupled with Ronald McDonald Children

Charities of Canada officially announce funding for Enviropark.

Nov. 18, 1990 "Enviropark gets Boost"  
Collingwood Connection reports on Todd Brooker grant.

Nov. 20, 1990 Fifth meeting of the Public Awareness Sub-Committee

Nov. 22, 1990 STP Steering Committee  
RAP coordinator and the PAC member representing the sewage treatment plant meet with consultants on the STP process audit, forming the STP steering committee.

Dec. 12, 1990 R.A.P. Rap Article: "Walk your property before the snow arrives"

Dec. 14, 1990 Ninth meeting of the Public Advisory Committee  
Update on RAP initiatives and environmental conditions.

Dec. 19, 1990 "Water Quality Within Guidelines"  
Enterprise-Bulletin reports on PAC meeting and current environmental conditions

Dec. 22, 1990 "Reducing Harbour's Grey Water"  
Enterprise-Bulletin reports on 'grey' water problem and its impact on harbour.

## 1991

January 9, 1991 R.A.P. Rap Article: "Making your property Environment-Safe Haven"

January 23, 1991 R.A.P. Rap Article: "Our Town's Water Pollution Control Plant"

January 23, 1991 STP steering committee  
Continued discussions on the process audit.

January 24, 1991 Sixth meeting of the Public Awareness Sub-Committee

Feb. 15, 1991 Tenth meeting of the Public Advisory Committee  
The remedial options document is finalized and public consultation on the options initiated.

Feb. 20, 1991 "Harbour Blueprint Set for Release"  
Enterprise-Bulletin reports on PAC meeting and announces that the remedial options document be reviewed at the open house on March 27.

February-March Sources of Harbour Pollution poster distributed to schools  
The public awareness posters are distributed to Collingwood Area

- schools to help teachers integrate the harbour into their lessons
- February 27, 1991 RAP in Ajax  
RAP coordinator presents information on Collingwood Harbour RAP to Ajax high school students.
- March 18, 1991 Presentation by RAP & PAC to Collingwood Council of the Remedial Options
- Mid-March 1991 Fifth Issue of the Collingwood RAP Newsletter:  
Remedial options and open house announced, sources of harbour pollution illustration featured.
- March 27, 1991 Open House on Remedial Options  
Participants at the Open House review the remedial options and provide comments.
- March, 1991 Sources of Harbour Pollution Poster  
Many residents request copies of this public awareness poster.
- April 4, 1991 RAP at the City School, Toronto  
RAP coordinator presents information to the City School high school students.
- April 9, 1991 STP steering committee  
STP steering committee reviews progress on STP process audit.
- April 11, 1991 RAP at Humber College, Toronto  
Rap coordinator presents information to Humber College students in course on Man and the Biosphere
- April 22, 1991 Earth Day Rap Open House at CCI, Collingwood  
Highschool students at Collingwood Collegiate Institute recreate open house on remedial options.
- May 24, 1991 RAP Enviropark media release  
RAP Coordinator presents funds from MOE to the Town of Collingwood and PAC representatives in support of the RAP Enviropark
- May 30, 1991 Fitweek and Access day, Collingwood  
RAP Coordinator presents water quality issues to grade 4 - 6 students from 12 classes from 4 schools.
- June 6, 1991 Seventh meeting of the Public Awareness Subcommittee  
Discussion on ENVIROPARK

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| June 7, 1991      | 11th meeting of the Public Advisory Committee<br>Technical update on sediment and water quality<br>Discussions on zero discharge, implementation issues               |
| June 13, 1991     | STP steering committee<br>STP steering committee reviews progress on STP process audit.   |
| June 14-16, 1991  | RAP and PAC display at boat show.<br>Boat show at Lighthouse Point Marina in Collingwood features<br>RAP/PAC display and information items.                           |
| July 11, 1991     | 12th meeting of the Public Advisory Committee<br>Workshop on water quality simulation modelling, presentation of video  |
| August 11, 1991   | Collingwood Connection article on ENVIROPARK  |
| August 22, 1991   | Eight meeting of the Public Awareness Subcommittee<br>Review of progress on ENVIROPARK, discussion of RAP<br>information package for highschools and community groups |
| August 28, 1991   | STP steering committee<br>Review of progress on STP process audit   |
| Sept. 11, 1991    | RAP at Humber College, Toronto<br>Rap coordinator presents information to Humber College students<br>in course on Man and the Biosphere                               |
| Sept. 19, 20, '91 | 13th meeting of the Public Advisory Committee<br>Selecting preferred remedial options and a strategy for<br>combining technical and nontechnical approaches           |
| Sept. 25, 1991    | The Enterprise Bulletin coverage of Sept 20 meeting   |
| October 6, 1991   | Letter to the Editor, Collingwood Connection, from RAP Coordinator<br>and PAC Chairperson on CSL proposal and RAP principles  |
| October 8, 1991   | RAP Coordinator discusses preferred options on local radio show:<br>CKCB "Chats" program  |
| Nov. 1991         | PAC Chairperson presentation of Collingwood Harbour RAP to the<br>Collingwood Chamber of Commerce   |
| Nov. 22, 1991     | 14th meeting of the Public Advisory Committee<br>Release to PAC of first draft of Stage 2 document<br>Discussion on delisting criteria, costs for RAP implementation  |

Nov. 27, 1991 Enterprise Bulletin coverage of November 22 meeting.

Nov. 30, 1991 Enterprise Bulletin coverage of November 22 meeting.

December 4, 1991 Enterprise Bulletin, Letter to the Editor from RAP Coordinator on cost of RAP implementation

## 1992

January 24, 1992 15th meeting of the Public Advisory Committee  
Discussion on incorporating RAP/PAC principles for the protection and enhancement of Collingwood Harbour in the Official Plan. Revisions of the draft Stage 2 report, examination of draft implementation structure.

January 1992 Enterprise Bulletin: There's Nothing Like the Great Lakes, letter to the editor from PAC

January 1992 Presentation on the control of purple loosestrife to Seniors of the Royal Canadian Legion by PAC member Leone Hall

Feb 3, 1992 Press Release on Jan. 24th PAC meeting sent to Enterprise Bulletin, Collingwood Connection, Owen Sound Sun Times

Feb 20, 1992 CKCB Radio interview with Fred Dobbs on the Black Ash Creek Rehabilitation Project

Stream Rehabilitation Presentation to Georgian Triangle Angler's Association, F. Dobbs and Carl Eichenburger

Feb. 26, 1992 Meeting of the Public Awareness Subcommittee

Presentations on the BAC Rehabilitation Project to Collingwood Collegiate Institute (F. Dobbs)

March 3, 1992 Media Release to acknowledge contributions by Molsons and Beaver Lumber to ENVIROPARK

March 10, 1992 Presentation to Collingwood Rotary Club Environment Subcommittee on BAC Rehabilitation Project

March 23, 1992 Presentation by RAP Team member M. D'Andrea to University of Western Ontario, Faculty of Engineering: The use of numerical modelling with computer graphics in the evaluation and selection of



pollution control options: Collingwood Harbour, a case study

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| March 23, 1992  | RAP Coordinator Presentation to Town Council and Planning Committee: Collingwood Harbour Draft Stage 2: preferred options and adoption of RAP Principles in the Official Plan<br>Televised on Maclean Hunter Cable TV. |
| March 24, 1992  | CKCB Local radio news broadcast reports on presentation of RAP to Council  |
| March 30, 1992  | Meeting of the STP subcommittee to discuss funding and implementation agreements for STP Optimization strategy   |
| March 1992      | Georgian Triangle Anglers Association Special Publication: 12th annual Spring Trout Derby carries article:<br>Collingwood Harbour RAP: A synopsis  |
| March 31, 1992  | Backpack Electrofishing Course given to students at Collingwood Collgeiate Institute by F. Dobbs   |
| April 1, 1992   | Meeting of Public Awareness Subcommittee on Purple Loosestrife Control Strategy  |
| April 22, 1992  | Public launching of the Purple Loosestrife Control Program, extensive media coverage   |
| April 25 and 26 | RAP Display at Collingwood "Mother of all Yardsales" organized under the Georgian Triangle Waste Management Master Plan  |
| April 28, 1992  | Presentation of the RAP, including Stage 2 Options, by RAP Coordinator and PAC Chair to Blue Mountain Power Squadron, Collingwood  |
| May 3, 1992     | "Purple loosestrife action days planned" Article in the Enterprise Bulletin  |
| May 22, 1992    | 16th RAP/PAC Meeting to finalize membership on implementation subcommittees  |
| May 25, 1992    | Press conference marks the start of construction of ENVIROPARK. Presentations by Perrin Beatty MP, Jim Wilson MPP, Mayor Barker, Ed Houghton and Gail Krantzberg.  |
| May 27, 1992    | RAP Coordinator presentation at environmental conference for area grade schools in Wasaga Beach  |

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| May 28, 1992     | RAP/PAC participation in Fitweek activities, Collingwood   |
| May 31, 1992     | "ENVIROPARK getting set to open" Article in the Collingwood Connection   |
| June 7, 1992     | Article in the Enterprise Bulletin: The Greening of Spring. Written by RAP Coordinator to encourage environmentally sensitive gardening practices.   |
| June 7, 1992     | RAP/PAC participation in Enviromania, an environmental festival coordinated by Creative Carees Systems in Collingwood. Proceeds go to ENVIROPARK. Press Coverage in Enterprise Bulletin, Collingwood Connection, Huronia Sunday, and Toronto Star. |
| June 11, 1992    | PAC receives cheque from the Rotary Club in support of the Black Ash Rehabilitation Project. Press coverage June 14, Enterprise Bulletin   |
| June 20-21, 1992 | RAP/PAC display and involvement in Boat Show at Ruperts Landing, Collingwood   |
| June 23, 1992    | Press Release attended by PAC Chairperson: Perrin Beatty, MP, announces \$50,000 for Black Ash Creek Project. Coverage in the Enterprise Bulletin and Collingwood Connection   |
| June 29, 1992    | RAP Coordinator interviewed on CKCB Radio Chat's program, on Purple Loosestrife, Harbour Day, and the Black Ash Creek Rehabilitation Project.  |
| June 29, 1992.   | Over 1500 press releases sent to newspapers, magazines, radio and television stations, and others describing the Purple Loosestrife Control Program  |
| July, 1992       | Presentations on Black Ash Creek Rehabilitation Project to service clubs, environmental groups, Chamber of commerce, school groups by project Coordinator.   |
| July 1, 1992     | "ENVIROPARK: Leaning by Osmosis". Article in the Enterprise Bulletin   |
| July 5, 1992     | "Fighting Purple Loosestrife". Article in Enterprise Bulletin highlighting the Purple Loosestrife infestation and control program of the RAP   |
| July 1992        | Enterprise Bulletin lists Purple Loosestrife Control Program for three weeks in "Calendar of Events", prior to event.  |

- Collingwood Connection lists Purple Loosestrife Control Program in "Wat's On " column for 3 weeks prior to event
- July 11, 1992 Initiation of the Purple Loosestrife Control Program in Harbourview Park. Volunteer groups adopt plots in the wetland to physically remove loosestrife. Posters circulated to local business in town one week prior to event. Over 80 people attend.
- July 11, 1992 CKVR Barrie provides coverage of the "War against Purple Loosestrife" on the 6:00 pm and 11:00 pm news.
- CBC radio provides coverage of the "War against Purple Loosestrife" on the national news
- Huronian Sunday coverage of Purple Loosestrife Event
- K106.5 and Hamilton radio station interview RAP Executive Assistant
- CFTR television Toronto (CTV network) on camera interview with PAC Chairperson and RAP Executive Assistant
- July 13, 1992 Owen Sound Sun Times "Battle Waged Against Invader" interview with RAP Coordinator and other participants
- July 28, 1992 Meeting of the Black Ash Creek Rehabilitation Project to coordinate partnerships
- August 1992 Organization meeting to develop term of reference for the Coastline Development & Sustainability Subcommittee
- August 28, 1992 17th meeting of the Public Advisory Committee. Review of terms of reference for implementation subcommittees, discussion on details of PAC incorporation. Proposed final meeting prior to adopting the new implementation structure.
- August 29, 1992 Harbour Day 92. Third biennial harbour day to celebrate the release of the Stage 2 RAP and transition to the implementation phase of the program. Presentation of the Collingwood Harbour RAP Stage 2 Document to the Hon. Ruth Grier by PAC Chairperson.



## EnviroPark Progress

Ed Houghton, left, Chairperson for the Public Advisory Committee and Don Jacques, right, Chairperson for the Public Awareness Sub-Committee gladly receive a \$10,000 donation from Progress Club President, Jerry Talsma. The money is essential cashflow for the construction of EnviroPark which should be ready for play by the end of the month.

## Adopt a plot to fight the beautiful killer

Dear Editor:

On behalf of the Collingwood Harbour RAP Team and Public Advisory Committee (PAC), we would like to extend our appreciation and gratitude to the many volunteers who waged war against the invasion of the Purple Loosestrife, Saturday, July 11.

Over 80 people donned shovels, spades, and shears in an attempt to control the spread of this beautiful killer in the harbor wetland at Harbourview Park. The weather was grey and the work was demanding, but the spirits were vibrant in the face of the challenge.

This, however, is just the start. We are encouraging all those who care about preserving this precious habitat

to adopt a plot and continue to remove Loosestrife this summer and into the future. We wish to honor those who do so at Harbour Day '92 to be held by the public launch on the Grain Elevator Pier, August 29. Please call the Department of Parks, Recreation, and Culture at 444-2500 to adopt a plot.

And a special thank you to the Department of Parks, Recreation, and Culture for helping us make this control program a reality and to The Enterprise-Bulletin for several highly informative articles and briefs leading up to this event.

Yours Truly,

Gail Krantzberg  
Co-ordinator  
Collingwood Harbour RAP

## The ENTERPRISE-BULLETIN

HOME NEWSPAPER OF THE BLUE MOUNTAIN AREA

OUR BUSINESS HOURS:  
Mondays to Fridays 8:30 a.m. to 5 p.m.  
Closed Saturdays and Sundays

## War waged against loosestrife

# Battle waged against invader

By SCOTT DUNN  
Sun Times staff

**COLLINGWOOD** — The first offensive in a life-long battle against purple loosestrife was carried out in Collingwood Saturday.

The purple-blossomed weed, which multiplies at will and chokes wildlife habitat with its woody stems and vast root system, has begun to take over important wetland areas by Collingwood's harbor.

Lou Damore and Eileen Barry of Toronto were cycling by the harbor at the end of Hickory Street when they decided to do what more than 50 others had done earlier that day — dig purple loosestrife.

A local group that is cleaning up the harbor chose loosestrife as its latest target and organized the dig.

The two high school teachers parked their bicycles and with shovels provided, they learned how to identify and dig out the weed.

"I've never seen it (first-hand)," said Damore, a science teacher who coincidentally saw a TV program about it the day before.

The two placed the dug weeds into bags, which were added to the 20 others that had been collected earlier in the day.

They will be burned by the fire department later.

Gail Krantzberg, co-ordinator for Collingwood's Remedial Action Plan (RAP) group which organized the loosestrife dig, said the best that could be hoped for was to control the spread of the weed known as "purple plague".

"We can't hope to eradicate the plant," she said.

Each plant releases 2.7 million seeds over its lifetime and has no natural enemies. Seed can lay dormant for 30 years and remain viable, she said.

The only way so far of battling the plant is to dig as much out as possible, and return in subsequent years until the root system is exhausted.

No herbicide or biological means of safely killing the plant has yet been found, she said.

Loosestrife has been compared to another European import, the zebra



Sun Times photo by James Masters

Erica Jeffery (right) holds bag for Lou Damore and Eileen Barry

mussel — which is competing for food with native fish and clogging water intake pipes in the Great Lakes.

Both may have come to Canada in ship ballast water, and have few if any natural enemies.

Krantzberg is encouraging people to adopt a plot of land which they promise to keep clear of purple loosestrife for one year.

To adopt a plot, she suggested people should call the town's parks and recreation department at 444-2500.

Erica Jeffery is the co-ordinator of the Ontario Federation of Anglers and Hunters' Project Purple campaign against the weed.

Her group is working in the Owen Sound area and in Trenton as well as caring for test plots by the Collingwood harbor to see how effective cutting the plant is.

She said the weed is easily mis-

taken for other plants which look similar.

Purple loosestrife has a square, reddish stem. Its green leaves are long and smooth, not jagged. The leaves grow in pairs, at alternating right angles up the stem. Leaves on more mature plants grow in threes.

The blossoms have pinkish-purple petals and yellow stamens in the centre. Blossoms last for about a month, usually blooming in July.

The plants thrive in moist habitats, but will grow almost anywhere, Jeffery said.

In Collingwood, purple loosestrife has been designated a noxious weed, meaning property owners must remove it.

If the plant can't be burned, it should be bagged and sent to the dump, she said.



Sun Times photo

Dr. Gail Krantzberg



# Enviro-Park: Learning by osmosis

From giant toilet to education tool for children and adults

By KEVIN WERNER  
The Enterprise-Bulletin

It began in 1989 as a giant toilet. The initial idea was the brain-child of Ben Bennett of the West Simcoe Waste Reduction and Recycling Commission.

It was to construct a one-of-a-kind playground on five acres of land at Collingwood's Harbourview Park. The hook was to have the playground's focus center around the local environment as an educational theme.

Like Alice in Wonderland, there would be an enormous toilet, an accompanying sink and drain and a large tub, all facilities that one would find in a house. A huge wheel that could be spun with information about the local environment somehow etched on it, revealing to children and their parents the ups and downs of water as it flows in a house.

"It originated with the desire to show people there are alternatives to hazardous waste," said Mr. Bennett. "It was to show there is a connection from the end of the pipe to the other end, a side we rarely look at."

Mr. Bennett took the idea to Collingwood's Remedial Action Plan's (RAP) Public Advisory Committee (PAC) and to Peter Dumbor, Collingwood's director of Parks, Recreation and Culture. "Peter got involved with it pretty quickly and it became a reality."

"It is soon because apparent it (the original idea) wasn't feasible," said Gail Krametzberg, Collingwood's RAP co-ordinator.

Numerous meetings were held with an ever-increasing number of government agencies, consultants, and interest groups, everybody intrigued by the unique project — if realized.

After a strategy was developed, consultants consulted, the playground structures approved for children's use, the original idea was watered down into a more focused and educational perspective.

The wheel concept remained, but instead of spinning it, the wheel was the frame for Enviro-Park. A miniature Collingwood would be constructed, that included a water treatment plant, water tower, general store, power plant, industry, agriculture and harbor. Accessible pathways would be built integrating the structures and two sets of pipes would run through the buildings — grey pipes would be for sewage treatment plant water, blue pipes for good water.

"It was initially a house structure," said Mr. Krametzberg. "But the basic project is the same with the same environmental idea: to teach people how to use water, learn how water is converted, what not to pour down the drain, how it's used, where water goes in a house, the sewage treatment plant, what it can clean and what it can't clean. It's an excellent teaching tool, with the children learning by osmosis."

She said a number of government agencies seized on the innovative idea, willing to contribute to the project, and even more importantly "spreading the word beyond the province and North America. As far as I know it's the first of its kind in the world. Even my boss (from the Ontario Ministry of Environment) was pleased



Enviro-Park, based upon an environmental theme is being built at Sunset Point Park. The park is not to open into this summer.

with the project." Total cost of the project was estimated to be about \$110,000 in 1990, but has since grown to between \$237,000 to \$250,000.

Money was raised through outside agencies such as Environment Canada through the Great Lakes Clean-up Fund which contributed about \$37,000, with another donation for \$10,000 in 1992-93 (a ceremony

"It's one of the best projects from our point of view," he said. "Secondly, it's not limited to an age group. Adults can be educated, and then they can educate their children. We're saving a small part of the world."

"Nobody had ever heard of it before," said Mr. Dumbor. "The idea was to teach kids subliminally. It was unique: a first-ever structure like



A playground structure being constructed at Sunset Point.

announcing the construction of Enviro-Park at Sunset Point Park was held May 25, 1992). Collingwood parking is with about \$40,000 in 1991, and is expected to pay in another \$25,000 in 1992 — mostly for storage facilities for Enviro-Park's modular play structures — Ronald McDonald Children's Charities, through Todd Brooker Resorts, Beaver Lumber, Nelson Bennett, Progress Club and the Collingwood Optimist Club.

Norm Sandberg of the Optimist Club, who has been involved with the Enviro-Park project, said the Optimist Club bought equipment for the park to be used for physically challenged people and other equipment for people to use.

## Harbourview may cost town \$100,000

The recent blizzard and bomb from Collingwood Councilor Sal Greco over the municipality's ownership of Harbourview Park is significant for Collingwood's future.

A portion of Harbourview Park was once used as a landfill site. Waste from such local industries as LOF Glass, Harding Carparts, Goodyear and Goodall were dumped into the (former landfill) site. The site was closed in August, 1973.

"We put so much feet of clay, soiled and soiled, covered over and nobody bothered with it," said Don Green, environmental services manager for Collingwood. "It was closed as it should be. It was not exhibiting any environmental problems. Nobody complained."

Then on February 27, 1990, Simcoe County passed Bill 201, allowing the county to take over all municipally-owned landfill sites.

In the last summer of 1990, operations began to construct Enviro-Park on the former landfill site.

"There was some miscommunication, the county raised concerns, there was a number of issues to look at such as liability, the condition the MOE (Ministry Of The Environment) would impose, the reasonable use guidelines."

The end result was building the Enviro-Park at Harbourview Park, violated the environmental guidelines of building on a landfill site before its 25-year moratorium was up.

Therefore, under Section 45 of the Environmental Protection Act, an environmental assessment had to be done for the landfill site.

The assessment would include reviewing the site, conducting bore hole testing for any methane gas and test piling to see what is inside the former site.

Because of the referee's nature that was dumped into the site, Mr. Green said there would be no decomposing garbage, therefore no methane gas.

Don Jacques, Remedial Action Plan's Public Advisory Committee co-chair for public awareness and who was intimately involved in the Enviro-Park project, said the referee,

simply said, "There's no problem with decomposing garbage."

Since Simcoe County now owned all landfill sites through Bill 201 passed in February 1990, no construction at Harbourview Park could be done until the landfill site was properly closed. An environmental assessment would have to be completed, costing the municipality and the Enviro-Park about \$100,000 and delaying the environmental park construction for about two to three years.

"For six to 10 months we tried to negotiate (with the county and the municipality of the environment)," said Mr. Dumbor. "We had several meetings with the county, legal and provincial ministry and the county waste management department. Obviously, it would take several years. We just wanted to build the park."

"I learned a incredible amount of bureaucracy," said Mr. Jacques. "We initially thought the environmental assessment would be a phase-in type of operation in keeping with section 45 of the county jurisdiction of the landfill site."

But the Enviro-Park people discovered the assessment would have to include all 25 acres of Harbourview Park, and not just the five acres identified for the park.

It was decided in the spring of 1992 to move Enviro-Park to another local. A number of locations were considered, but finally only one spot had the public accessibility, space and geography to fulfill the philosophy and concept of Enviro-Park — Sunset Point.

"Sunset Point is better," said Mr. Jacques. "Harbourview was built on poor soil, at Sunset Point the soil is good. And there is a cost savings because it will be (built) on good soil, there are also more people who come to Sunset Point."

(Mr. Jacques said the costs for the preliminary building at Harbourview Park were not recoverable.) Mr. Jacques said Enviro-Park's original Harbourview Park design would not be compromised, saying there was only "minor" design changes in order to fit into the Sunset Point Park area. And since the playground structures were modular and easy to assemble, there would be no need for modifications.

(The playground structures have been in storage in the public works building waiting to be installed.) "We're not making it smaller," he said. "It will be very co-operative for the children."

Mr. Bennett said Sunset Point attracts more people than Harbourview Park, even though for the Enviro-Park concept, it "makes sense" to build it at Harbourview Park. Although, Mr. Bennett said his prime area for Enviro-Park would have been on the west end of the Canadian Shipwreck Lanes' property.

"It would be a wonderful gesture. But it will never happen."

Despite the politics, the bureaucracy, the confusion and the periodic setbacks, the goal is Enviro-Park, a new concept in playground design and teaching tool, will become a fact.

"People will see it and that's the point," said Mr. Bennett. "I can't believe nobody else thought it up before."

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"We've never had any problem with the site," said Don Green, Collingwood's Environmental Services manager.

"It got to be a major undertaking," said Mr. Green. "It cost the county wanted to construct the assessment for the whole 25 acres of Harbourview Park, and not just the five acres area for the Enviro-Park location. The Enviro-Park committee, decided it was time for alternative arrangements and moved Enviro-Park to Sunset Point Park."

Said, if Collingwood wants to build anything on Harbourview Park, or if it wants to implement the recommendations contained in its Waterfront Study, an environmental assessment has to take place, said Mr. Dumbor.

"They know what they put in," he said. "There's no leakage from the site going into the water."

"It must be done so it won't affect the town's water," said Steve Khan, Simcoe County environmental services manager.

"It's not a case of it being a danger. We have two concerns, methane gas and ventilation. It's not unworkable. But you have to do it."

In the meantime, the municipality continued to maintain Harbourview Park, a county-owned facility, as well as sparking the use of Councilor Green.

Currently, the town is examining the problem to find if an accommodation can be found with the county. Mr. Green said as the town owns the town will have to negotiate a cost-sharing program with the county to pay for the environmental assessment, since the cost is just too much.

"What do we do with the park," he said. "How can you plan for it now?"

manager. "There's no problem with decomposing garbage."

Since Simcoe County now owned all landfill sites through Bill 201 passed in February 1990, no construction at Harbourview Park could be done until the landfill site was properly closed. An environmental assessment would have to be completed, costing the municipality and the Enviro-Park about \$100,000 and delaying the environmental park construction for about two to three years.

"For six to 10 months we tried to negotiate (with the county and the municipality of the environment)," said Mr. Dumbor. "We had several meetings with the county, legal and provincial ministry and the county waste management department. Obviously, it would take several years. We just wanted to build the park."

"I learned a incredible amount of bureaucracy," said Mr. Jacques. "We initially thought the environmental assessment would be a phase-in type of operation in keeping with section 45 of the county jurisdiction of the landfill site."

But the Enviro-Park people discovered the assessment would have to include all 25 acres of Harbourview Park, and not just the five acres identified for the park.

It was decided in the spring of 1992 to move Enviro-Park to another local. A number of locations were considered, but finally only one spot had the public accessibility, space and geography to fulfill the philosophy and concept of Enviro-Park — Sunset Point.

"Sunset Point is better," said Mr. Jacques. "Harbourview was built on poor soil, at Sunset Point the soil is good. And there is a cost savings because it will be (built) on good soil, there are also more people who come to Sunset Point."

(Mr. Jacques said the costs for the preliminary building at Harbourview Park were not recoverable.) Mr. Jacques said Enviro-Park's original Harbourview Park design would not be compromised, saying there was only "minor" design changes in order to fit into the Sunset Point Park area. And since the playground structures were modular and easy to assemble, there would be no need for modifications.

(The playground structures have been in storage in the public works building waiting to be installed.) "We're not making it smaller," he said. "It will be very co-operative for the children."

Mr. Bennett said Sunset Point attracts more people than Harbourview Park, even though for the Enviro-Park concept, it "makes sense" to build it at Harbourview Park. Although, Mr. Bennett said his prime area for Enviro-Park would have been on the west end of the Canadian Shipwreck Lanes' property.

"It would be a wonderful gesture. But it will never happen."

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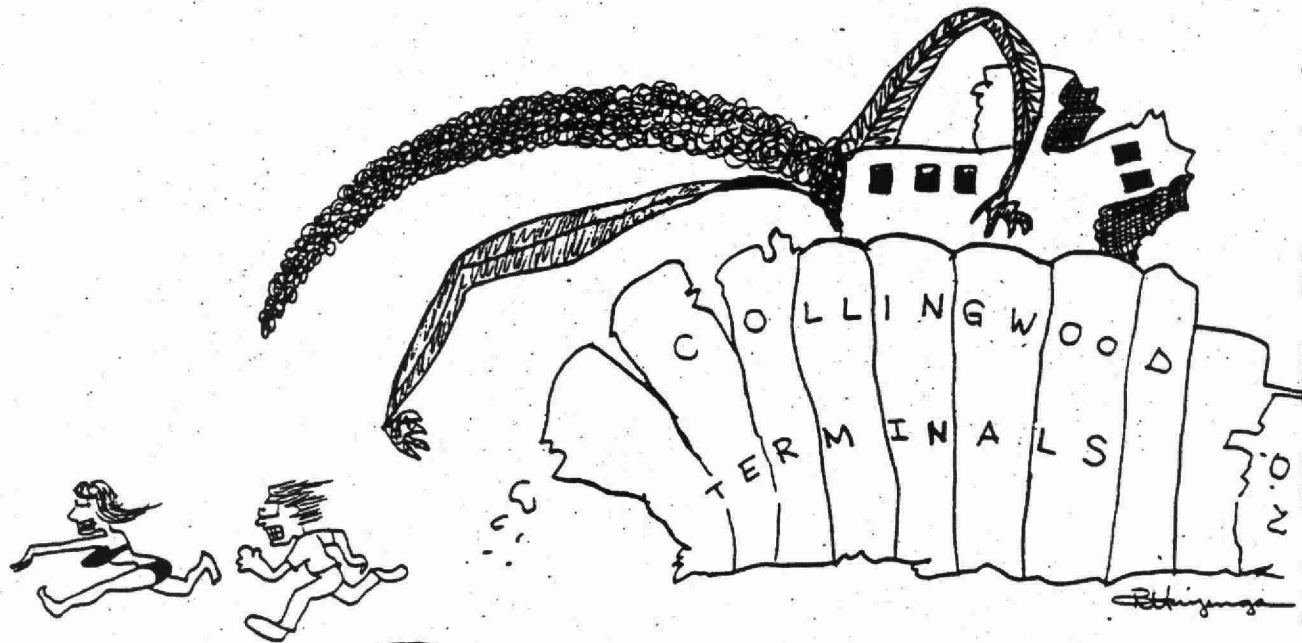
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# INVASION OF... THE PURPLE LOOSE STRIFE!



I HEAR THIS IS BASED ON A TRUE STORY.

JULY 1, 1992

**11** The Collingwood Harbour Public Advisory Committee of the Remedial Action Plan and the town will be waging war today against the killer weed Purple Loosestrife. The battle (wear workboots) takes place from 9 a.m. to 5 p.m. at the harbour (Hickory Street entrance), when the volunteer army will dig and destroy as many weeds as possible. Free refreshments. For more information, call 444-1034.

JULY 1, 1992

**Join the army  
to fight weeds**

The Collingwood Public Advisory Committee of the Remedial Action Plan and the town will be waging war against the killer weed Purple Loosestrife, Saturday, July 11 from 9 a.m. to 5 p.m.

1A/10/92

# The greening of spring

## A call to reconsider the use of pesticides and fertilizers on our lawns

by Dr. Gail Krantzberg  
Collingwood Harbour RAP  
Coordinator

Spring was late in coming this year, with trees leafing out well into May, and gardens beginning to grow with conspicuous hesitation. Now that our lawns and gardens are demanding our attention, perhaps hesitation is appropriate. If we hesitate before purchasing certain garden products, and choose more environmentally sound alternatives, we will reward ourselves with a cleaner, healthier environment.

Fertilizers contain nutrients essential for plant growth. Applied inappropriately or in quick-release formulations, these nutrients pose a sombre threat to our waterways. In Collingwood, runoff from our properties enters streams and storm sewers which carry excessive nutrients directly into Collingwood Harbour.

The Collingwood Harbour Remedial Action Plan (RAP) has been implementing actions to reduce nutrient loading to the harbour, in order to control the nuisance growth of aquatic plants. Control of phosphate from fertilizers is advocated by the Public Advisory Committee (PAC), and will help restore a balanced harbour ecosystem.

Phosphorus in urban runoff can be reduced if we stop fertilizing our gardens with fast acting chemicals, and turn to natural amendments for our yards. Grass clippings left on our yards recycle nutrients back into the soil. Organic mulches such as compost are splendid soil enhancers, and have the added charm of preventing weed problems and reducing water loss from the soil. Slow release products and organic fertilizers are available which are less damaging to the surrounding environment.

Insecticides and herbicides impart an even greater threat to our ecosystem than fertilizers. Many herbicides are known or suspected

carcinogens, and our experience with these compounds uncovers the capability of herbicides to induce reproductive failure throughout the food chain. These toxic substances pose a health hazard to the people applying them and to those who walk, sit, or play on a treated lawn. Pesticides that wash off our properties are conveyed into the harbour and the pristine waters of Georgian Bay by streams and sewer systems. Their persistent nature enables them to accumulate to dangerous concentrations in the tissues of animals living within our shores.

What we put into the environment returns to us in the form of contaminated water, fish and wildlife.

Fortunately, in Collingwood Harbour, herbicides are currently below our ability to detect them, but we should be conscious that it is only with a concerted effort to prevent their entry into our lakes and streams that we can protect our own health and the health of the ecosystem of which we are a part.

The Collingwood Harbour RAP and PAC has worked under the philosophy of zero discharge of persistent toxic compounds. To achieve this goal, we must eliminate the use of persistent pesticides.

There are no known herbicides that are innocuous. Adjusting our gardening practices will help avoid many weed problems. Mulching to smother weeds is not only effective, but increases soil fertility and moisture retention, keeping existing weeds from setting seed effectively controls annual species. Cultivating, hoeing, hand pulling will also feed the compost heap.

Considering that a weed is simply a plant out of place, perhaps we should revisit the curious goal of a perfectly manicured grass lawn. The diversity in plant form and fragrance can grace our properties.

Weedy areas provide food and

habitat for birds, small animals, and insects that can help control other garden pests. Clover and alfalfa are excellent ground covers that stabilize erosion, outcompete many undesirable weeds in bare areas, and enhance the nitrogen content of soils for improved plant growth and vigour.

For control of powdery mildew, brown rot, and leaf spot, sulphur powders are effective and will not endanger the environment. If diseases do take hold, picking off diseased portions of plants will stop the spread of pes organisms. Place the prunings in a sealed bag for disposal. Many compost heaps are not hot enough to kill pathogenic fungi, bacteria and viruses.

Chemical insecticides can eradicate pests, however, natural predators also disappear, as does the possibility of nature's balance to control the pest species. As these chemicals are washed into our waterways, aquatic insects that form the base of the food chain can be eliminated or contaminated, affecting fish and other predators. Therefore, using nature's built in mechanisms for controlling the undesirable species will provide a long term control unachievable with pesticides, and will prevent the contamination of our streams, lakes, harbour and Bay.

The best defence against pests is a healthy and vigorous plant that will be resistant to attack. Proper nutrition and watering will certainly help, as will keeping the garden free of infested plants. Biological control using bacteria, and predatory and parasitic insects can establish nearly permanent repression of many pest species.

Shelter the beneficial insects by furnishing patches of small-flowering species such as Queen-Anne's-Lace, wild mustard, catnip, daisies and mint. Insectaries and some garden suppliers sell lacewings, lady beetles, and minute parasitic wasps that are capable of controlling a wide range of

pests. BT (*Bacillus thuringiensis*) is a very effective bacteria that controls caterpillars. Since caterpillars of attractive moths and butterflies can also be eliminated, it is important to limit coverage to the leaves of effected plants.

A vigilant program of hand picking can vanquish Colorado Potato beetle, Japanese beetle, tomato horn worm, caterpillars and other large bodied insects. Dehydrating dusts made of diatomaceous earth work well against borers, slugs, snails and earwigs. Yellow sticky traps offer protection against onion flies, cabbage root flies, cabbageworms, and thrips.

**Chemical controls should only be used as a last resort.**

Toxic compounds in organic sprays break down into harmless compounds quickly, compared to the persistent toxicity of most conventional pesticides, although a few traditional herbicides such as paraquat are also inactivated upon contact with the soils.

Herbicides derived from plants, like pyrethrin, rotenone and nicotine should be applied with care, if at all, well away from water access. They can be poisonous to aquatic insects which are a vital part of the food chain. Mineral oils and insecticidal soaps mixed with pyrethrines, offer protection against common insect pests such as scale, thrip, spider mite, and aphid.

Given a bit of planning, most of us can avoid the use of chemical fertilizers and pesticides all together.

Remember that ultimately, we consume what we apply to our gardens, either through direct exposure during application, or from the food we eat and water we drink.

Ultimately, runoff will carry the products we use into our lakes, streams and the sparkling waters of Georgian Bay.

Refuse toxic herbicides, return



### A sign of the times

There are natural, safe alternatives to pesticide and herbicide use, says Dr. Krantzberg, that will not only help your lawn, but save the harbour and preserve our drinking water from toxins.

your grass clippings and compost to your yards to amend your soils, request beneficial insects and remove pests and weeds by hand. Reestablish your link with the environment and recognize that if each of us makes these changes, generations to come will benefit.

The Collingwood Harbour RAP has been working towards restoring and sustaining a vibrant and vigorous harbour ecosystem. With each of us becoming more aware of the significance of the choices we make, the harbour and surrounding waters will be protected.

# Enviropark getting set to open

COLLINGWOOD CONNECTION MAY 31, 1992.

"Where learn time meets play time," Enviropark should be completed by July 1st.

Politicians and guests kicked off construction of the nearly two acre park that will demonstrate the flow of water from the source, through residential, commercial, industry and agriculture on its way to the harbor.

The playground is the brainchild of the Collingwood Harbour Remedial Action Plan Public Advisory Committee, and chairperson Ed Houghton expects Enviropark to "revolutionize the playground.

"It will reinforce the concept of environmental responsibility," he said.

MP for Wellington, Grey, Simcoe, Dufferin Perrin Beatty presented \$10,000 on behalf of the Ministry of the Environment's Clean-up fund and noted Collingwood was "presenting leadership for the Great Lakes community.

Dr Gail Krantzberg, RAP coordinator, said she anticipates the Collingwood Harbour to be the first to be de-listed as a "hot-spot" under the International Joint Commission on pollution in the Great Lakes.

"We truly have gone very far down the road to recovery," she said.

Collingwood is one of 17 "hot spots" on the Great Lakes. Areas are listed because the high amount of contaminates in the harbor, though Collingwood is the only one listed, not because of toxic contaminates, but because phosphorus levels are abnormally high.

Krantzberg said the Enviropark is a key public relations move on the Remedial Action Plan, and the upgrading of the Water Pollution Control plant is a key technical requirement.

"If water quality continues to be sustained, then I will be approaching the IJC with a document I intend to begin in the fall," she said. "We are pretty much at the forefront."

One person can make a difference

# Are you misusing precious water?

By LEONE HALL

Become aware of how water is being used and misused at your home and place of business.

Little things - small habits formed and obsolete habits discarded - can make a big difference. Make a contest of it - discuss at dinner hours and over coffee breaks - the little ways each person has become aware of waste, of how to reuse water before it goes down the drain and ways one can divert the cleaner used water away from the STP by watering plants, gardens, trees, etc.

This water will eventually find its way directly into the harbor via storm sewers, bypassing the STP, and if you do not allow it to be contaminated by hazardous products, is purified by nature as it filters through the ground.

Remember that fertilizers and chemicals added to lawns and gardens also bypass the STP via the storm sewers and end up in the harbor untreated. Collingwood Harbour is receiving too much nutrient - a major problem. Hopefully people will make themselves aware of exactly what and how they are contributing to the problem of nutrient load to the harbor and will spend the winter months finding ways to cut down on the quantities used of various products rather than using the quantities recommended by profit oriented merchandisers.

## Rinsing waste

The biggest waste of water in a kitchen is "rinsing" dishes, vegetables, hands, etc. under a running tap. Often that tap is running hot water which is very costly. Every time you turn on a tap - try to think objectively about exactly what you are doing. Ask yourself, can I modify this job or do it another way with the same end result but not the same cost in

gallons used, and hence dollars wasted?

Fresh water - this precious resource we appear to have in such abundance but which is drying up in the unusual and quickly changing worldwide climate patterns - must not be misused. The dollars spent in cleaning water for our use is completely wasted if unnecessary amounts of clean water are flushed down our drains.

Thinking about our own water wasting habits over the last few months (with this column in mind) one does quickly become aware of how little changes can make a difference in efficient use of water. By reducing water use we reduce the volume needed to be treated by the STP and reduce the total amount of nutrients (phosphates) entering to our harbor.

When working around the kitchen (baking and preparing meals) leave a container in the sink with water for the numerous little hand rinsings one does as we switch from one job to another; have a dish pan to put hot rinse water in so it can sit in the sink or on the counter to rinse pots and pans or put it in the sink when cleaning vegetables - about 10 cm (4") of water in a dish pan uses far less water than filling the larger circumference of the sink to a depth of 10 cm (4").

## Full cycle

A modern dishwasher on regular full cycle uses about 72 litres (16 gallons) of hot water and on energy saving "economy" cycle will use about 54 litres (12 gallons). The price of their convenience shows up on your water and hydro bills. However, used only when full and properly loaded, a late model dishwasher can be a big boon in a busy household. Some models have a water heater

built in so if cold water pours from the tap the heater clicks on and the dishwasher does not start until water temperature is at the maximum recommended, which is costly in hydro.

If you decide to "run the tap to get very hot water" then put a container under the tap to collect the running water until it is hot enough to commence the wash cycle properly. Usually three to four litres of clean water will be in that container before the water is hot enough to efficiently use the dishwasher. This clean water can be used for other purposes - hand laundry, washing vegetables, watering house plants or trees.

Experiment with the amount of shampoo used to wash your hair, then keep cutting back on the amount until you can do a good job with the least chemicals and oils going into the STP. Research new products/technology before buying from ease of habit. Example: shampoo and hair conditioners can be bought as one product now and some of these are for "full body" use as well, so one small amount of one product is used instead of three separate products.

Applied to all the products used in our homes and offices, this kind of heads-up buying and daily use of "minimum quantity" thinking would result in significant savings in nutrient load to the STP and in your actual dollars expended.

Small habits to form...at no out-of-pocket cost to you...but if we would all work on changing these basic habits...it would make a noticeable impact on the environment and our

harbour in particular.

EDITOR'S NOTE: Leone Hall is co-chair of the Remedial Action Plan Awareness Committee of the Collingwood Harbour Public Advisory Committee. For further information, telephone RAP coordinator, Dr. Gail Krantzberg collect at (416) 323-4956.

# Scientists discover nocturnal creature

Evidence of a large prehistoric, fresh-water reptile living in Collingwood Harbour has been detected by the new Canadian satellite "EKAF", sources with Environment Canada's Federation of Outdoor Life (FOOL) have revealed.



A photograph captured this profile of 'Lancelot' in front of Collingwood Terminals.

Photo by Ian Chadwick

Dr. R.U. Serious, of Ottawa, Ont., writes in this week's Journal of Key Environmental (JOKE) issues, that the creature "resembles a large lizard" surviving on a herbivore diet of weeds and algae. Heat sensors beamed from orbit traced the nocturnal saurian species at 12:01 this morning.

"The lizard, which we'll call Lancelot of the Lake, surfaces annually on this date," said Dr. Serious, "usually in the early morning. There's no threat to Collingwood residents, or to the harbor's fragile ecosystem."

In fact, the scientist states that Lancelot will soon exhaust his current food supply in Collingwood Harbour and will then move on to clean up other "hot spots" identified by the International Joint Commission (IJC) throughout the Great Lakes.

Because of the reptile's nocturnal habits, few people other than herpetologists (specialists in reptile life) have spotted the lizard, say scientists. About the only time you can see the lizard is during its mating period, which occurs about this time, says Dr. Serious.

"The male is usually a dull grey color except during mating season when it becomes an iridescent green. It crawls out onto a rock or log and croaks loudly to a prospective female of the species: "LirpA LooF! LirpA LooF!"



## Purple Loosestrife taking over our wetlands

Wherever this beautiful weed grows, it produces a dense mass of roots that out-compete other plants for nutrients and space. The woody and dense root systems quickly choke out original species of plants, forming thick stands that can maintain themselves for up to 20 years.

This process alters the ecosystem, resulting in losses of fish, wildlife and native flora. Because the habitat is no longer compatible as a food source or a breeding ground, the natural inhabitants, whether permanent or migratory, move away or perish. Many species are lost to that area for good.

The rootstalk consists of a taproot with many secondary roots. A single rootstalk of an older plant can produce a rootcrown up to 0.5m across and generate as many as 50 stems. These stems form a colorful wide-topped clump capable of producing over two million seeds in a single season.

Loosestrife flowers from July through September in Ontario. Tall, erect with stems reaching heights over two metres, topped with its distinctive reddish-purple inflorescence, it is an attractive (albeit deadly) environmental signal on the landscape. Confused sometimes with Fireweed, Blue Vervain or Blazing Stars - Purple Loosestrife can be identified by two leaves on the stiff, four-sided stalk, that usually grow opposite each other. It is a good idea to walk your property and your neighbourhood while Loosestrife is in bloom and identify the area and the size of plot.

Seeds are dispersed by floating on water, carried by wind, on the bodies of water fowl, turtles, etc; in the cooling systems of outboard engines and in the mud & debris adhering to shoes, vehicles and animals. Loosestrife is a problem from the Atlantic to the Pacific Oceans.

The only proven way to get rid of this noxious weed (so termed in Collingwood bylaws) is to pull it out, one root at a time. Put a bag

over the head of the plant to prevent seeds from flying around. Better still, dig out the plant when the flowers are just beginning to open before its seeds form. Keep contained in plastic bags until disposal because this hardy weed will root itself in water and in soil.

It is defined as a noxious weed in Collingwoods because "Loosestrife spreads readily and is very difficult to control; transmits plant diseases; poses health hazards".

For those with less than 10 acres of property Council puts a notice in the local papers asking you to pull any loosestrife on your property by the 10 June. If, after that date stipulated, your property is not free of loosestrife, the Works Department will do so, and the charge for this will show up on your tax bill.

For those with more than 10 acres of property, a notice will be sent to you by mail or courier giving you seven days to clean out this noxious weed or the Works Department will do so and add the charge to your tax bill.

Prevention is the most effective control of this persistent weed, deadly in its invasion of our wet areas: ditches, marshes, bogs, stream and river banks and swampy areas.

In the near future, concerned organizations and individuals in Collingwood will be asking all residents of the area to make a concerted effort to pull up loosestrife wherever they see it in the area, and to contain further invasion of our wet areas and degradation of our vulnerable soil. Loosestrife's dense root mat traps sediment so that the natural tendency for shallow wetlands to evolve toward dry land is greatly accelerated. Watch you this paper for further information re plans to curtail growth of Loosestrife.

The danger to our waterways and farm lands cannot be stressed too highly. It should be discussed in newsletters and at meetings to raise people's awareness of what Purple Loosestrife is doing to our fragile ecosystem.

Collingwood Library has information about Purple Loosestrife and after reading further on the subject, you may realize the urgency of cleaning it right out of Ontario stalk by stalk.



## COLLINGWOOD

## Harbor policies restrict: Greco

Councillor Sal Greco called a proposal by Dr. Gail Krantzberg to integrate the principles of Collingwood's Remedial Action Plan (RAP) into the town's Official Plan "restrictive".

"This is not needed," said Councillor Greco, after Dr. Krantzberg described through a slide presentation, the progress RAP has made improving Collingwood Harbour's water quality since 1986. Dr. Krantzberg asked council if it would approve a motion to adopt the principles contained in RAP's mandate into Collingwood's Official Plan.

In a letter to council, Dr. Krantzberg stated: "The goal is to ensure that individual actions are compatible with the goal of restoring the harbor ecosystem. With greater awareness of the importance of water conservation, the informed selection of consumer products, and other activities, the community can assist in sustaining and enhancing the harbor and the aquatic environment in general. With the continued assistance of council, Collingwood Harbour is well on the road to full recovery."

Councillor Greco though said Collingwood's waterfront will be protected through provincial and federal ministries' guidelines.

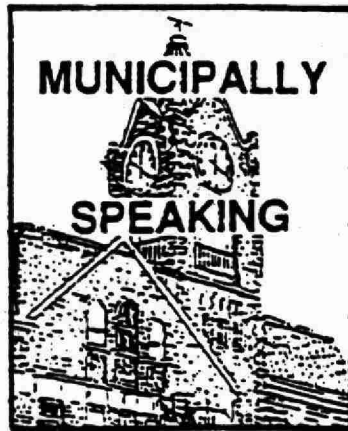
"Another restriction will make it more difficult," said Councillor Greco. "Everybody has a chance to comment (on proposed impact on the water). It's another restricted agency."

"The agency is ourselves," said Collingwood Mayor Ray Barker. Mayor Barker said Collingwood has always strived for good water quality. "Now we're putting it on paper," he said.

"No we're not," shot back Councillor Greco. "We control development, preventing people from flushing toilets into the harbor. We're still controlling."

Peter Dunbar, director of Parks, Recreation and Culture said the intent of the RAP letter is asking council to support RAP's three years of work. "It's not another set of restrictive rules," he said. Town Planner Nancy Farrer said including RAP's water quality principles into the Official Plan will inform developers "these are the standards" Collingwood wants them to abide by.

"(It's) not restricting anybody," she said. "This is the way of the 90s." Councillor Blaine McKenzie pointed out it usually is the responsi-



bility of the municipality to safeguard its resources and not the provincial or federal governments.

"The ministries shuffle it back to us," he said. "We want good quality water in the harbor." Councillor Guid Minardi agreed saying what RAP was asking from council was a "general statement" about protecting Collingwood's waterfront and "putting it on paper".

Councillor Sal Greco also criticized RAP and Dr. Krantzberg for "striving for utopia" in an effort to completely clean-up Collingwood Harbour and delist it from the International Joint Commission's list of 17 Areas of Concern along the Great Lakes in Ontario. "Your point is well taken," commented Dr. Krantzberg.

She said Collingwood is attempting to become the first Area of Concern to be delisted. "But it's difficult to give you a time frame" for delisting she said. Council voted 8 to 1 approving Dr. Krantzberg's request, with Councillor Greco the sole dissenter.



Sal Greco

March 28 1972

# COLLINGWOOD HARBOUR

PUBLIC ADVISORY COMMITTEE



R.A.P. Rap

## One person can make a difference

### What are you putting into the sewage treatment plant?

By LEONE HALL

During the last several weeks of the year we are inundated with requests for the needy - for money, food bank supplies, free use of services or equipment - all desperate, legitimate requests to fill a need.

If these needs are not filled the consequences are far-reaching -- hurt this generation, and indeed future generations -- because for example, if children do not get proper nutrition they do grow up deficient - mentally and/or physically.

Here is a need to which you may not have given too much thought. Here is a need you can fill and it will save you money. I am talking about the needs of your harbor and the town sewage treatment plant. Officially termed the Water Control Treatment Plant we all (affectionately?) use the term "STP". Here too, if environmental global needs are not met now, the consequences will be far-reaching and hurtful to our future generations.

We hope you will have been following newspaper updates on the activities of your Public Advisory Committee and its efforts at coming up with a suitable and affordable Remedial Action Plan to restore the harbour environment and to delist Collingwood Harbour as an Area of Concern (designated in 1977 because of degraded water quality).

**Input:** Our STP does an excellent job of processing the daily input of 18,000 cubic metres or four million gallons before this cleaned water enters the harbour.

How can you save your own money from literally "going down the sewer"? It's easy. Make yourself (and all your family and co-workers at places of business) aware of when and why and how you turn a tap on; flush the toilet; draw a bath; use the shower, a garden hose, the dishwasher, the washing machine; use shampoo, hand soaps, bath oils, lotions for body and hands; use household and vehicle cleaning agents, etc. Remember that what goes down the drain does not disappear. It ends up at the STP.

Now comes the money saving part. Cut by half and even more (with many products) - the quantity of oils, detergents, shampoo, toothpaste, etc. that you use so automatically in daily hygiene, cooking, gardening and housekeeping chores. Advertisers like to sell large

quantities of their product so their TV and print advertisements show people running a thick line of tooth paste the entire length of a tooth brush, for example. Experiments prove less than 2.5 cm (1/4 inch) of tooth paste on a brush is more than ample to do a good job of cleaning teeth.

**Water:** The other thing to become aware of is the amount of water going directly down the drain unused while cleaning teeth, washing hands, running the tap until water reaches the "right temperature", etc. Adopt this easy habit - wet the tooth brush, fill a cup or glass with water then turn the tap off during the routine of brushing. The cup of water is usually sufficient for rinsing mouth and tooth brush. The same principle and routine can be used when washing hands i.e. wet hands and soap them, turn water off while washing and back on to rinse.

These two changes in habit alone could save an average household around four to eight litres of water per day per person. If there happens to be four or six people in your family that adds up to a considerable saving i.e. 6 x 365 days x 8 litres could save 17,520 litres of water in a year. You pay for this water twice -- the gallonage shown on the meter at your home plus the amount on your tax bill which is your share of the cost to process and 'clean' that (mostly unused) water to health standards before returning it to the harbour. The clean water that pours down your drain unused still has to go through the costly cleaning treatment at the STP before being flushed on into the harbour.

"Running water" unnecessarily is even more costly when that water is hot because you pay three times, - first cost shows up on the water meter bringing it in to the home or business; second cost shows up on the hydro meter for heating it; third cost shows up on your tax bill for a) processing and bringing clean water into your premises and b) processing outgoing water through the STP.

Watch this column for more ways to keep from "throwing your money down the drain".

**EDITOR'S NOTE:** Leone Hall is co-chair of the RAP Awareness Committee of the Collingwood Harbour Public Advisory Committee. For further information, telephone RAP co-ordinator, Dr. Gail Krantzberg, collect, at (416) 323-4956.

## COLLINGWOOD

# Preferred option wins approval

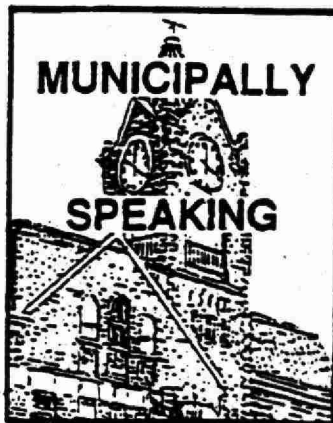
The first preferred option of Collingwood's Remedial Action Plan (RAP) was approved by Collingwood's general committee for a total cost of about \$150,000 over two years.

Don Green, Collingwood's environmental services manager said optimizing the sewage treatment plant by reaching the RAP's phosphorus goal and improving in excess wastage control will conform to the requirements of the RAP recommendations to improve Collingwood's water quality. A computer enhanced audit of the plant by CH2M Hill suggested two optimizing approaches: alum addition pump control and the investigation of dual point addition, he said in his report.

If both of the improvements prove successful, it could save the plant adding tertiary filtration at a cost of between \$7 and \$13 million, said Mr. Green in his report. Other benefits would include providing data for future expansion, realizing chemical savings, and it will delay for two years extending the sewage treatment plant's outfall at a cost of \$2.1 million.

Improvements to the sewage treatment plant is one of the preferred options being recommended by RAP in order to improve the water quality of Collingwood's Harbour and to eventually remove the harbor from the International Joint Commission's list of the Great Lakes' Area of Concern. The cost for the improvements is estimated to be about \$450,000, funded equally by the municipality, Environment Canada and the Ontario Ministry of Environment. The town's share of the cost will be about \$75,000 per year.

Mr. Green said there would be "no impact" to the town's 1992 operating budget since if need be, the money could be taken from the sewage treatment plant's reserve fund. In answer to a question from council, Mr. Green said implementing the phosphorous optimizing plan would result in about a 10 per cent cost savings or \$12,000 per year to the town. As well, there would be a four ner," said Collingwood Reeve Doug Garbutt during Monday's general committee meeting.



## The Collingwood Harbour Rap: A Synopsis

Prepared by  
Gail Krantzberg,  
Collingwood Harbour RAP  
Coordinator

Ontario identified Collingwood Harbour as one of 17 Great Lakes Areas of Concern (AOC) as part of a binational agreement to restore and protect the Great Lakes. Nuisance algal growth plagued the harbour waters up until the mid 1980s as a result of excessive phosphorus inputs to the harbour. The federal and provincial governments assembled a Remedial Action Plan (RAP) Team, with a goal which is vital to the future of Collingwood: to improve the harbour's water quality and restore or maintain the beneficial uses that the harbour supports.

In fulfilling this mandate, the RAP has followed what is known as an "ecosystem approach." In short, that philosophy means that whatever remedial actions are taken, they must be consistent with a respect for the entire Collingwood Harbour ecosystem, the animals, plants and people that interact with one another within a shared environment. As a result, wildlife habitat, sources of contaminants beyond the harbour, and land uses that effect water quality, also fall within the RAP's purview.

Public consultation and involvement is central to the RAP. In addition to its consultative role in establishing goals and beneficial uses and evaluating and selecting remedial actions to achieve those goals and uses, the Public Advisory Committee (PAC) has also helped in raising public awareness of RAP activities. In future, the PAC will assist in generating support for the implementation of remedial actions and will provide a means of reporting to the community on the effectiveness of remedial measures once they are in place.

On the basis of use goals approved by the PAC and the large data base on environmental conditions and sources of potential problems, options for remedial action in Collingwood Harbour were generated. The scope, objectives, advantages, disadvantages and estimated costs of each remedial option were presented in detail for public consideration. After a lengthy process of consultation and review with the PAC, the RAP Team has reached a consensus on the preferred remedial measures for Collingwood Harbour.

A critical component of the strategy is to reduce the amount of phosphorus entering the Harbour. This will prevent excessive growth of aquatic plants which can rob the water of oxygen as they decay, thereby making the harbour inhospitable to other species. While some technical solutions focus on further improvements to the operation of the Collingwood Sewage Treatment Plant, the single largest contributor of phosphorus to the harbour, a strong emphasis has been placed on educating the community on the environmental significance of water conservation and the use of environmentally helpful products. From school children to industrial water users, the RAP and PAC are developing or have programs in place to encourage renewed respect for water as a precious resource.

To provide safe haven for all members of the harbour ecosystem, efforts are in place to protect the existing Collingwood Wetland Complex, and to rehabilitate fish and wildlife habitat in conjunction with future development at the waterfront. The philosophy of zero discharge of persistent toxic substances has been adopted by the RAP, for the protection of all members of the ecosystem.

Continued On Page 6

MOST SIZES IN STOCK

## The Collingwood Harbour Rap: A Synopsis

Continued From Page 4

As a result of the community's dedication to the RAP, water quality has improved dramatically over the last 5 years due to noteworthy improvements in the STP operation, and process changes at local industries. The challenge is to unite the community in a long term plan that will enable the Harbour to support a diversity of uses while maintaining a diversity of life. The goal is to ensure that individual actions are compatible with the goal of

restoring the harbour ecosystem. With greater awareness of the importance of water conservation, the informed selection of consumer products, and other activities necessary to respect and protect the Harbour, and the aquatic environment in general, Collingwood Harbour is well on the road to full recovery.

\*For more information please call Mr. Ed Houghton, P.A.C. Chairperson (445-1800) or Dr. Gail Krantzberg, R.A.P. Co-ordinator (416-323-4956 collect).



# PAC prepares delisting strategy: outlines options for restoring harbour ecosystem

Enterprise Bulletin March 1/92

Improvements to Collingwood's harbour came another step closer to reality this week as the Collingwood Harbour Public Advisory Committee (PAC) gets ready to submit its strategies for delisting the harbour as an area of environmental concern to government agencies.

A draft report of the Remedial Action Plan (RAP) second stage was presented at a committee meeting Friday morning in Collingwood outlining preferred options for restoring the harbour's ecosystem.

Seven remedial actions necessary for the delisting of the harbour were identified:

- computerize manual operations at the sewage treatment plant to improve cost and energy efficiency of the plant.
- reduce water consumption to cut down on waste treated at the plant.
- dilute effluent discharged into the harbour by relocating current outfall with a diffuser.
- apply new technology on a large scale to improve efficiency of the sewage treatment plant.
- use the harbour as a demonstration site for sediment removal projects funded by the federal government.
- protecting wetlands from development.
- rehabilitate harbour sites to provide fish and wildlife habitat.

Implementing these seven action plans would cost about \$3 million, although some programs would be eligible for government funding. Other costs will have to be covered by the town.

RAP coordinator Gail Krantzberg said these and other proposals will be reviewed again by the committee before it is presented to government agencies for approval.

Dr. Krantzberg said when other comments and information will be added to a final draft of the document, now about 160 pages, it will be submitted to the Canada Ontario Agreement Review Board this month and then ultimately to federal and provincial ministries and the International Joint Commission on the Great Lakes.

In reaching this point, the current PAC had to decide how the proposals contained in the document would be implemented.

The committee voted to set up another body which would act as a watchdog group to ensure improvements to the harbour were being carried out effectively.

This audit committee would function outside of the core group, although there was considerable confusion whether it would merely add more bureaucracy to the process.

Jim Kilgour, who would chair the audit committee said an independent group was needed to "police" the plan in its implementation stages in the next few years and monitor its progress.

He said the committee would be composed of local stakeholders, such as harbour-area landowners, developers and interested residents.

"We don't have a stakeholders group that needs to look at the whole picture," he said.

The audit committee could also include people currently on the main public advisory committee, which is an umbrella group to five subcommittees.

Some members of PAC said creating another body would be redundant.

PAC member Ben Bennett said people currently serving on PAC would end up serving on this audit committee, and questioned the difference between the two groups' agendas.

"We're going around in circles," he said.

Don Jacques echoed the same doubts, saying there would be no need for the same people to meet outside of the core group to comment on the progress of their work.

In the end, though, no one opposed a motion to adopt the audit committee, which is expected to be given another name.

The PAC meeting also discussed an upcoming Harbour Day and another open house to keep the public informed of plan's progress.

It was suggested both events be combined to be held on the same day later this summer.

## ***Harbor plan to be released this spring***

The community is expected to get a look at the Remedial Action Plan stage 2 report this spring.

The public advisory committee recently looked at it in draft form. The final document will identify how action will be implemented and by whom in order to take Collingwood off the list of Areas of Concern in the Great Lakes basin.

Although the area is currently listed the Collingwood Harbour RAP co-ordinator Dr. Gail Krantzberg said water here is almost at accept-

able levels for the prevention of nuisance algae growth. That growth originally put the harbor on the list of 43 areas of concern. But RAP officials add, additional measures are needed to ensure that water quality improvements persist into the future.

Each household in Collingwood will receive a newsletter shortly which outlines remedial options preferred by PAC. These include education programs to make the public aware of the effects of toxic products flushed down drains.



# There's nothing like the Great Lakes

By LEONE HALL

This week, I want to share with you some prose taken from the "Perspectives" section of the Great Lakes Reporter, June, 1991. With the Great Lakes an integral part of our daily life, I would also like to share with you the following facts:

Marine systems form 71 per cent of the Earth's surface (Prof. K. Ronald, University of Guelph).

The Great Lakes contain 20 per cent of the world's supply of fresh

water. We should feel grateful that fate has placed us in a position to enjoy the benefits of living and working along these Great Lakes' shores.

It is imperative that our management of this resource be taken seriously and consideration given to its self-sustainability so we may, with a clear conscience and pride in our stewardship, leave it in good health for future generations to profit by and to enjoy.

The prose has been adapted a little for local use:

There is nothing like the Great Lakes anywhere else in the world. It's easy to forget that, living near the sweetwater seas and driving and walking past their shores every day. It's easy to forget why we should protect this pristine resource. But, when we do it, it's easy to explain why.

To explain why, we could talk about magnificent sand dunes, Meaford clay banks, and Georgian Bay's thousands of islands and the spectacle of a roaring Lake Superior storm and the St. Lawrence River's Beluga whales and a hundred other things that exist only here, nowhere else. We could try and convey in a few words that restoring and preserving the health of these lakes is not just a matter of improving the environment we live in, but also of making sure this unique ecosystem survives to amaze another generation, and another, and another.

We could try, but I think there is a

better way. If a picture is worth a thousand words, then living it must be worth hundreds of thousands of words.

Go out and live the Great Lakes and see and remember this salient fact: There is nothing like the Great Lakes anywhere else in the world.

**EDITOR'S NOTE:** Leone Hall is a member of the Collingwood Harbour Remedial Action Plan Public Advisory Committee.

mas, it would be permitted.

Enterprise Bulletin Dec. 4/91

## Repairing century of environmental misuse

Dear Editor:

The Collingwood Harbour Public Advisory Committee (PAC) meeting held on November 22, marked the third anniversary of the formation of PAC.

I would like to extend my heartfelt appreciation to the members of this citizen's committee for their dedication to the restoration of the Collingwood Harbour ecosystem. We have faced many uncertainties together, and throughout the process have explored numerous scenarios in a candid and co-operative manner. I particularly commend the PAC chairperson, Ed Houghton, for keeping the PAC focussed on its critical mandate and directing discussions to realistic and practical conclusions.

An excellent example of PAC's assistance in developing the RAP is the discussion that surrounded the cost implications associated with RAP implementation at our November 22 meeting. In a study commissioned by the RAP Team, costs per person to rehabilitate the harbor were

presented. The costs were the maximum to be anticipated, and included a possible, albeit unlikely projection that no funding assistance would be provided by provincial or federal agencies. Costs were also based on the assumption that all the options being recommended for inclusion in the plan would have to be implemented to restore the harbor, which may or may not be the case.

PAC members provided direction on further refinement of the figures, in recognition that the values presented were the "worst case" scenario. The PAC provided guidance on estimating the contribution from seasonal residents, on examining the per-person-costs of each remedial option separately, and on recalculating the figures to reflect probable values of provincial and federal grants. In addition, the perception that the proposed remedial options were distinct from other Town initiatives was dispelled.

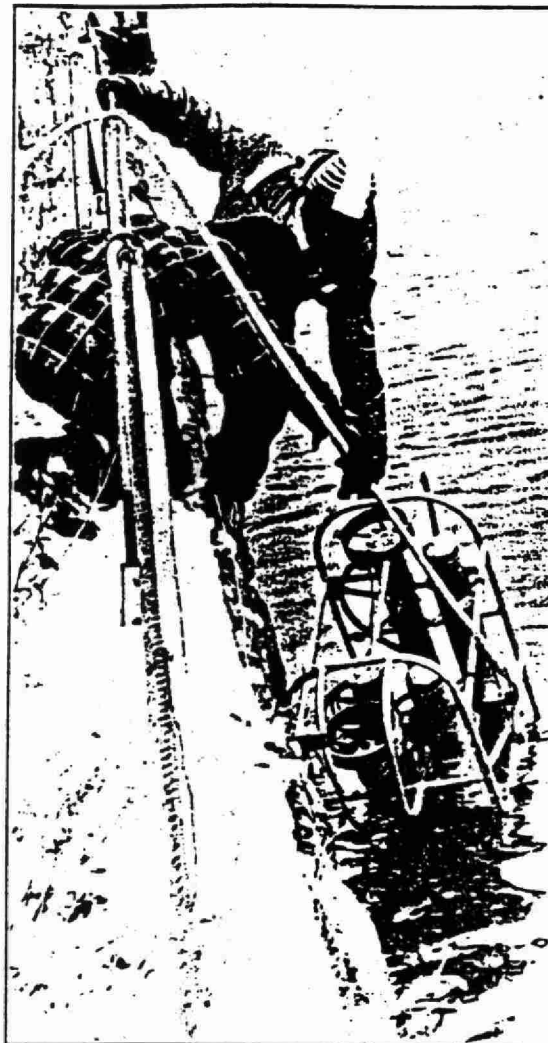
The utility of the ongoing study is to put into perspective the cost of

repairing over one century of environmental misuse. It has been estimated that the cost of cleaning up all of the Canadian RAP sites is well over \$6 billion. The maximum costs associated with implementing the RAP in the short term is \$87 per person for five years. The actual cost, incorporating PAC recommendations, will very likely be substantially less. When these values are revised the community will be in a position to examine the affordability of the plan,

and will have the information necessary to approach municipal, provincial and federal agencies for assistance in restoring Collingwood Harbour for now and for the future. Once again, I thank PAC for their invaluable assistance.

Yours truly,

Gail Krantzberg, Ph.D.  
Collingwood Harbour  
RAP Co-ordinator  
Environment Ontario



Into the underworld - Roger Santiago (facing camera), of Environment Canada, helps Rob Cameron of Hydrobotics lower the Orpheus ROV into the eastern slip in Collingwood Harbour.

## Orpheus explores a new underworld

Orpheus, according to Greek mythology, descended to the underworld. It's a fitting name for device which has been exploring the underworld of the Collingwood Harbour.

The ROV - Remotely Operated Vehicle - sank into Collingwood Harbour for two days last week to explore the debris along the bottom, guided by employees of Hydrobotics, its Ajax-based manufacturer, and Environment Canada. Orpheus was used to survey the slipways and harbor bed to help assess what sort of equipment will be needed next spring when dredging operations begin.

The picture of the debris and the harbor floor are startlingly clear. Orpheus sails slowly underwater, just above the bottom, its video cameras scanning the remnants of decades of dumping and construction in the shipyards.

"There's a lot of debris there," said Roger Santiago of Environment Canada. "It may be difficult to dredge."

Ed Houghton, chairman of the PAC, said the group wanted to examine the debris to make sure there wouldn't be problems using the proposed pneuma-pump dredge system. He added Orpheus was also there to examine the elevator wall and to look for zebra mussels. The wall was found to be in good condition and

dredged from its base.

So far no one has found zebra mussels in the Collingwood Harbour, but they were found in Georgian Bay as close as Owen Sound this past summer. The PAC group expects to view the video tapes before the next year and will be looking carefully for the mussels.

### Canadian made

The technology behind Orpheus is Canadian made, and used worldwide for hydrographic studies, environmental studies, under ice and salvage operations, underwater photography, aquaculture and even military operations. Recently the company won a contract from the U.S. Navy, over its American competitors.

When Orpheus is finished its inspection, the video tapes made from its passage will be viewed by the MOE and the RAP/PAC group to determine what work is required.

## COLLINGWOOD

# Harbor water quality a municipal mandate

By KEVIN WERNER  
The Enterprise-Bulletin

After much philosophical discussion about the mandate of the remedial action plan, the public advisory committee will integrate the RAP principles protecting Collingwood Harbour's water quality into the town's official plan for future generations.

Ed Houghton, public advisory committee (PAC) chairperson said the purpose of PAC is "not to comment on the type of development."

"However, it's important Collingwood and developers ensure that future developments have no overall negative impact on the harbor's waters."

Mr. Houghton told the PAC members during their Friday meeting at Cranberry Inn the mandate of PAC is to only examine the waters "within Collingwood Harbour, the watersheds like Black Ash Creek and anything else that would impact on

the harbor".

He said the PAC cannot discuss the specifics of the Canadian Steamship Lines \$230-million waterfront development proposal or "whether it's a 12-storey building or more open space".

Mr. Houghton told PAC members he has expressed the PAC's opinion on the CSL development through the town's newspapers, in a letter to the town and mayor and by appearing at a televised council meeting.

In a letter to the mayor Mr. Houghton and Dr. Gail Krantzberg, RAP co-ordinator expressed the PAC's views on the CSL project.

### 'Take action'

The letter stated the CSL development "must take appropriate action to prevent the impairment of water quality due to sediment resuspension, particularly from the CSL launch basin".

The letter said about 4,000 cubic

meters of material is in the launch basin such as lead and zinc in the form of welding rods and other debris, which will be removed in a dredging operation in May 1992.

It continued that developing the Collingwood Shipyard property "could enhance" the harbor ecosystem if:

- The sediment is managed according to Environment Ontario and Environment Canada guidelines;
- The harbor's ability to process nutrients is protected; and
- The creation of fish and wildlife habitat.

But Ben Bennett, a citizen-at-large on the PAC, said the committee must comment upon the CSL project because "that's why we're here".

"We're making a big fuss about nothing," he said.

He said there is "nothing in the world wrong with" commenting on developments.

Leone Hall, public awareness sub-committee co-chairperson said it's important PAC "makes some kind of statement... to let the community know that PAC is making a statement on the waterfront."

### Three issues

Lee Martin of CSL addressed three issues during the meeting in response to CSL's proposed project.

He said the "volumetric quantum" of the harbor will increase, creating shoreline, the proposed canals encircling the development will not be "stagnant pools" and the shipyard property will be undergoing a third series of environmental testing.

"We've done fairly extensive research on the (canal system) and they only work if there is circulation," said Mr. Martin.

He said CSL has been closely working with Environment Ontario for about two years and has agreed to a "a battery of third tests ... focus tests in and near these areas. Environment

Ontario, who has jurisdiction, has concerns mainly we don't open a cancerous wound. It is far from our goal to be rapers and plunderers."

Doug Garbutt, Reeve-elect to Collingwood council agreed the ministry would not allow CSL to dump contaminated fill back into the harbor to be used as infill.

"If there was going to be infill of the harbor they would not be allowed to dump it back further into the harbor. It would be disposed of in whatever fashion or manner," he said.

At the urging of Jim Kilgour, a teacher at Collingwood Collegiate Institute, PAC should create a set of criteria that could be incorporated into the town's official plan to protect the harbor's water from all developments present and future.

"So if we disappear a year from now when everything is all solved, then council still considers these issues when looking at a development," said Mr. Kilgour.

Dr. Krantzberg said in co-operation with Town Planner Nancy Farrer, a draft proposal for amending the town's official plan will be crafted "to consider all types of developments so when this PAC disbands, any future document will be an ongoing issue for council to consider."

Mr. Houghton congratulated the PAC members for not just discussing the CSL proposals, but to considering all proposed waterfront developments that would affect the harbor.

"I think it's good we have gone from the specific to the generic," he said.

## COLLINGWOOD

# 'Maximum costs' presented in study Economist prices clean-up of harbor

By KEVIN WERNER  
The Enterprise-Bulletin

Preliminary figures presented Friday reveal Collingwood taxpayers could be paying more taxes to offset remedial action plan options' costs to clean up Collingwood Harbour.

An uncompleted study by Mike Zegarac, an economist working for the Inland Water Directorate, Environment Canada, stated at a remedial action plan (RAP) public advisory committee (PAC) meeting, Collingwood taxpayers will pay an extra \$87 in taxes for five years and an additional \$164 in taxes for 10 years.

"I'm trying to sit here and not get panicky," said Collingwood Mayor-elect Ray Barker, a member of the PAC.

"Yea, well, I'm getting panicky," countered Ben Bennett, a citizen-at-large on the PAC.

Mayor Barker said the numbers have to be placed in context. He said the figures are the maximum that taxpayers will pay per year, the study does not include the fact government grant money being distributed to the Collingwood Harbour RAP group, it contains no cost-sharing arrangements between the federal and provincial governments and the town and the figures represent the costs if all RAP options are implemented to clean up the harbor.

"These are maximum figures," said Mayor Barker. "We don't know how much the feds or the province or whatever are going to put into it. We don't know exactly how many of the phases we have to do. We do know that we have water filtration coming in here for \$30 million for the next ten years. And that's increased water rates."

"I would be very, very annoyed if these types of figures that we're talking about this morning got on the street because they are not realistic," he continued. "Let's find out what's the real figure and then we can go from there."

Larry Hogarth, representing the Collingwood Yacht Club on the PAC said hefting the burden of responsibility on the RAP group for the harbor clean-up costs is unfair.

"If we (RAP) folded up and walked out the door, the town would be doing a bunch of these things anyway so it's not really the RAP that is doing it."

Both Mr. Zegarac and Karl Schaefer, a planner for the water planning and management board of the Inland Water Directorate, Environment Canada agreed the figures cited in their presentation, "need to be refined".

"It's a start," said Mr. Schaefer.

Mr. Zegarac echoed the sentiment saying the figures are "unrealistic".

The preliminary study states the short-term RAP costs of \$87 per person -- defined over a five-year period -- would include implementing three RAP options to clean up the harbor. They are:

- Optimizing operations at the sewage treatment plant -- cost about \$1.1 million;
- Extending the sewage treatment plant's outfall into Nottawasaga Bay with a defuser -- estimated cost about \$2.1 million;
- Rehabilitating areas for fish and wildlife habitat -- estimated cost \$2.4 million.

In the long-term -- defined as a 10-year period -- the RAP costs of \$164 per person, would include the above options plus three additional projects:

- The construction of a new sewage treatment plant at the industrial park to treat industrial effluent -- estimated cost \$21.3 million;
- Installation of tertiary treatment facilities at the sewage treatment plant -- \$15.2 million;
- Pre-treat industrial wastewater at sewage treatment plant -- cost about \$2.3 million.

The study revealed in 1991, education expenses are \$944 per person, with the municipal expenses at \$1,282 and federal and provincial expenditures at \$8,776 per person.

Ed Houghton, PAC chairperson said information he has received reveals it will cost about \$6 billion to clean up all of the areas of concern on the Canadian side of the Great Lakes.

Don Green, environmental engineer at the Collingwood sewage treatment plant said "one of the options, possibly two, the plant can make the current (the RAP) criteria by the year 2001-2004, but not at these kinds of costs."

Mr. Green said the sewage treatment plant will be able to handle the town's waste treatment for the next

10 years, but "taking into consideration no growth".

Reeve-elect Doug Garbutt said no RAP costs are included in the town's 1992 budget. As well, he said rumors persist the federal government will give responsibility of harbors back to the municipalities. Reeve-elect Garbutt said if the scenario were to occur "it would be pretty damn scary".

"We'd be the ones that would have to pay and we wouldn't have a hope in hell of paying it (the cost of cleaning up)."

Mr. Bennett questioned whether the PAC members should be even examining the RAP costs.

"Twenty-million bucks for a bit of seaweed on propellers, as a taxpayer I have a major problem," he said.

Gail Krantzberg, RAP coordinator reiterated the figures presented are "maximum costs".

She said examining the numbers provided a "good exercise" for the PAC, since the RAP costs will fill a political need for both the town and the RAP organizations.

Dr. Krantzberg said if the RAP has to implement any one of the preferred options and it can be demonstrated the municipality cannot pay, the numbers "give this RAP strong ammunition to go forward to the various agencies (saying) a stronger commitment is needed to restore the water quality".

She said though to restore Collingwood Harbour's water quality, only one or two preferred options need to be implemented in the short-term.

The PAC members asked Messrs. Schaefer and Zegarac to calculate per capita cost estimation on all of the RAP preferred options.



site. Enterprise Bulletin Nov:27/91

## Document outlines delisting targets

The public advisory committee (PAC) to the Collingwood Harbour Remedial Action Plan (RAP) received the working draft of the Collingwood Harbour stage 2 report at the Friday RAP meeting at Cranberry Inn.

The report is a set of preferred options for remedial action for delisting Collingwood Harbour from being identified as one of 42 areas of concern by the International Joint Commission on the Great Lakes. Gail Krantzberg, RAP co-ordinator explained the delisting criteria Collingwood Harbour must meet before it can be delisted.

The draft stage 2 document explained the measurable targets of the 14 beneficial uses. Ms. Krantzberg said even though the harbour meets the majority of the measurable targets, the PAC members must address all 14 delisting criteria before the IJC will grant Collingwood Harbour's request to delist.

"If we have not done our home-

work, the IJC will dismiss us," said Ed Houghton, PAC chairperson. The PAC members will examine the document then make suggestions for the next RAP meeting.

**On camera:** Operation Orpheus will be descending into Collingwood Harbour's watery depths Thursday and Friday. Orpheus is a 60-pound camera with 2,500 watt lights attached that will record a video of the harbor's wall near the Collingwood Terminals. Ed Houghton, public advisory committee chairperson, said a town councillor has expressed concerns about the integrity of the wall and whether it can withstand a proposed harbor dredging operation in May 1992. Mr. Houghton assured the PAC members divers have examined the wall and "they were surprised to see how good the wall was," he said.

Gail Krantzberg, remedial action plan co-ordinator said there is "no problem with the integrity of the wall or the disposal facility". The dredging operation in May will remove sediment in the harbor and place it in the confined storage facility near the Collingwood Terminals.

Charles Sandell, harbourmaster, said the operation will begin Thursday morning at 9:30 to 5 p.m. and Friday from 9:30 a.m. to 1 p.m. He said if there is bad weather or if the water freezes, the operation will be cancelled.



# RAP reps outline strategies to delist Collingwood Harbour

Collingwood Harbour's public advisory committee presented to council a preferred options position paper that will lead to delisting Collingwood Harbour from the International Joint Commission's list of Areas of Concern around the Great Lakes.

Dr. Gail Krantzberg, Collingwood Harbour RAP (Remedial Action Plan) co-ordinator and Ed Houghton, chair of the Public Advisory Committee (PAC) described for council the Collingwood Harbour RAP team's preferred options that will continue to rehabilitate the harbor's water.

Dr. Krantzberg said a number of options are currently being put into effect by the RAP team including a water conservation campaign initiated by the Collingwood Public Utilities Commission, and optimizing operations at the sewage treatment plant initiated by Don Green, environmental services co-ordinator, and Ken Astill, town engineer.

Dr. Krantzberg, though, pointed out another option to be implemented is to extend the STP outfall with a diffuser into the harbor.

She said extending the outfall into Nottawasaga Bay with a diffuser would allow the effluent from the STP to be easily absorbed by the water. She said the option is neither a "stand-alone solution", nor is it a "dilution solution".

"We are not trying to present that in any way," she said. "There will be no adverse effects on Nottawasaga Bay. And it is cost effective."

The estimated cost for extending the outfall would be about \$2.1 million, with the costs being picked up by the municipal government and provincial grants.

Other options in the draft paper include incorporating new technol-

ogy into the STP operations as it becomes available, (estimated cost \$1.1 million to be paid by municipality and provincial grants), rehabilitate areas of the harbor to provide fish and wildlife habitat (estimated cost \$2.2 million paid by municipal and provincial grants), wetlands preservation, and the use of the confined storage facility for contaminant materials.

## New dredging

Dr. Krantzberg informed council Collingwood Harbour will be a test site for the demonstration of new dredging technologies. Under the Great Lakes clean-up fund, Environment Canada has proposed pumping 1,000 cubic metres of material from the Canada Steamship Lines launch basin and between 200 to 300 cubic metres from the Collingwood Terminal walls into the confined disposal facility (CDF) near the Collingwood Terminals. Another 3,000 cubic metres of material will be removed from a dredging operation from the east end of the harbor to fill the CDF. Mr. Houghton estimated the CDF has about 8,000 cubic metres available.

The dredging operation was scheduled to occur in the fall, but because the machinery had to be constructed in Canada, it is expected the operation will begin in the spring of 1992, Dr. Krantzberg said. The cost will be borne by Environment Canada, Transport Canada, and depending upon the level of participation, by CSL and Collingwood Terminals, she said.

She said as the STP is being upgraded, plus the ongoing water conservation program initiated by the PAC, council should decide when to

extend the STP outfall. By implementing all the options, she said will satisfy the beneficial use goals of the harbor.

## Media strategy

Additional remedial options that have been on-going include constructing an environment playground "EnviroPark", a media strategy to inform the community what is happening to the harbor, and a RAP teaching package that is currently being printed.

Mr. Houghton said Collingwood's water conservation program adopted by area industrial businesses — LOI Glass, NACAN and Canadian Mist — as well as about half of Collingwood residents through the distribution of toilet dams and water conservation shower heads, has been a success resulting in less water use in the community, and less stress on the STP.

Dr. Krantzberg said the RAP's stage two paper containing Collingwood's preferred options will be ready early next year. She said the next step is organizing an implementation paper and outlining a delisting strategy for Collingwood Harbour.

Collingwood Harbour is identified as one of 43 Areas of Concern along the Great Lakes.

Dr. Krantzberg said later that it is possible to make an application to the International Joint Commission (IJC) for delisting. She said the plan is to apply for delisting with the IJC then approve the RAP team's request by 1993.

Dr. Krantzberg informed council of the RAP's concerns over the proposed Canada Steamship Lines waterfront development project.

She said the concerns centre on sediment removal on CSL's property, fish and wildlife restoration, and the in-filling of the harbor, that would lead to displacement of water preventing the assimilation of effluent.

Enterprise Bulletin Oct.6/91

*A copy of a letter to Mayor Barker and Council, forwarded to us:*

*Your Worship Mayor Barker, members of Council:*

Now that the proposed development of the CSL property has been presented for public information and discussion, we would like to provide you with the environmental concerns of the Collingwood Remedial Action Plan (RAP) and Public Advisory Committee (PAC). The community of Collingwood may have diverse opinions on the proposed land uses. It is the RAP's mandate, however, to restrict its involvement to issues that affect the harbour ecosystem, as we work towards its restoration and protection.

Any further development must take appropriate action to prevent the impairment of water quality due to sediment resuspension, particularly from the CSL launch basin. This is by no means an insurmountable obstacle, we have estimated that approximately 4000 cubic metres of material is present in the launch basin, a portion of which contains lead and zinc, as well as welding rods and other debris. Environment Ontario and Environment Canada, in conjunction with other partners, intend to remove all the material from the launch basin in the spring of 1992. This joint initiative is part project being developed to demonstrate the use of innovative dredging technologies, and to develop technologies that can be applied throughout the Great Lakes.

It should also be noted that if any sediment is to be removed from the eastern end of the harbour for construction purposes, this material is unsuitable for disposal in open water and must be deposited in the confined disposal facility adjacent to Collingwood

Terminals. A further implication of construction activities is the degree to which any filling of the harbour would affect the ability of the harbour to absorb and process nutrients. An increase in the amount of water displaced by land built into the harbour may increase local deterioration of water quality. We would expect this to be particularly pronounced in the east end of the harbour where our studies demonstrate that water movement and mixing in this zone is limited. Explicit consideration of retaining open water and preventing the degradation of water quality is required.

Concurrent with the extensive modification of the Shipyard shoreline there is an excellent opportunity for the creation of fish and wildlife habitats. In the present configuration, the property provides no suitable habitat. nearshore development would be constructed in such a way as to provide habitats for fish and other aquatic life. This restoration of habitat is a required consideration for all RAPs, and could easily be made compatible with the CSL proposal.

In summary, development of the Shipyards could enhance the harbour ecosystems if:

- sediment is managed according to the requirements of Environment Ontario and Environment Canada,
- the harbour's ability to process nutrients is protected, and
- fish and wildlife habitat is created.

The logic of providing a clean, safe aquatic environment for future users of the development should lead to cooperative initiatives between the Town, the RAP and PAC, and CSL, with ample input from the community.

If you would like further details on this issue or the RAP in general, we would be pleased to receive your requests.

*Sincerely,*

*Gail Krantzberg, Ph.D.*

*Coordinator, RAP*

*Ed Houghton*

*Chairperson, PAC*



Lacey  
is trainer

See 1b

# ERPRISE - BULLET

THE NEWSPAPER OF THE BLUE MOUNTAIN AREA

WEDNESDAY, JULY 17, 1991

COLLINGWOOD, ONTARIO

## Harbor options on video

Collingwood Harbour's public advisory committee on Thursday got an idea of what effect remedial options for the harbor would have with the help of a computer-generated video presentation.

Ontario Ministry of the Environment researchers explained how a computer program predicted the outcomes of various remedial action plans would have on the harbor from the extensive data collected in the Nottawasaga Bay and Collingwood Harbour.

The "Rand" model has been applied to harbors in Hamilton, Toronto, St. Catharines as well as Jackfish Bay in Lake Superior.

By measuring several factors such as water current, wind speed and direction, and shoreline configurations, the model's computer program performs a series of complex mathematical equations to simulate what would happen if certain actions were taken in Collingwood Harbour.

For example, the model predicted that if both the east and west wall of the harbor was opened to disperse waste from the Sewage Treatment Plant, the water quality of the harbor

would improve up to five times and the area of excessive levels of phosphorous would be reduced to 41,600 square kms.

The model's objectives are to:

- investigate water circulation;
- assess water quality changes during different current conditions; evaluate water quality in different areas of the harbor and the bay.

Collecting data involved setting up a number of stations in the harbor and the bay to measure current velocity and wind direction and speed.

The model also went into further detail of how the other options the committee is considering would improve the harbor, based on information for the months of September, October and November.

The video presentation showed with contour graphs how phosphorous concentrations changed by using a tertiary plant, opening the west gap, the east gap as well as both gaps at the same time.

The researchers said the model's predictions are representative of what would actually happen if certain actions were taken.

RAP co-ordinator Gail Krantzberg

said with this information, the public advisory committee would be able to better determine what the preferred options are for the remedial action plan.

"It's a step towards delisting," she said. "We have to decide which options are going to be the most effective?"

The model showed how much of an area would be improved and by how much, said Ms. Krantzberg, giving the committee more data.

"We have to balance the area we want to maintain clean water for with the health and the use of the harbor," she said.

But Ms. Krantzberg also noted that the models showed the effects in the harbor only, and the committee would have to determine the effects on Nottawasaga Bay as well. Workshops will be held for the committee in September for further discussion about the information from the model.

There was also considerable discussion at the meeting of how public education about reducing the amount of pollutants coming into the harbor would help stem the problem at the grassroots level.



## 'virtual elimination' realistic: PAC

How clean is clean? It was a conundrum Collingwood's Public Advisory Committee (PAC) wrestled with Friday.

Ed Houghton, PAC chairperson said the meaning behind "zero" discharge is an "extremely debated item". He said zero discharge of toxic waste into the environment can mean "zero" as in no discharge or it can mean "virtual elimination" of chemicals to the point where the toxic chemicals would be non-detectable with no effect upon the environment.

For Mr. Houghton, zero "means nothing". But for Collingwood's PAC to adopt this meaning "would be absolutely ludicrous".

"It would put industry in the area out of business," he said. "Places like NACAN, and Canadian Mist would have to change their process, a costly procedure. Virtual elimination is better."

Community liaison Ben Bennett said the goal should be zero, an objective that will take a "long time". But realistically the PAC should move into that direction. As well, Jim Kilgour, an education representative said at the present time with the best available technology "we can't do better with the equipment we have. It has to be reasonable," he said. Mr. Kilgour said to have zero discharge would mean nothing goes into the water, not even pigeon droppings.

Laurie Arron, assistant development officer for CN real estate said what the PAC was doing was debat-

ing "how clean is clean".

"What do we want to do, restore it before the white man came here?" he asked. In the end the PAC adopted the concept of virtual elimination of discharges into the environment.

"It's useful, it's measurable, it's workable and it's achievable," said Mr. Kilgour.

"It makes common sense," said Lee Martin of Canadian Steamship Lines.

### making choices

The Remedial Action Plan (RAP) is in the process of analyzing and drafting responses to the comments people made at the Open House on the Collingwood Harbour RAP discussion paper: Making Choices held March 26. Dr. Gail Krantzberg, Collingwood Harbour RAP coordinator, said despite the fact there was a limited sample to survey, people had varied views on the RAP options.

There was general support for the development of new technology for the sewage treatment plant, preserving the wetlands, the EnviroPark, the RAP information and teaching package, RAP bulletin board and a marine education program. Dr. Krantzberg said a number of preferred options were "misunderstood", such as a detention pond for the sewage treatment plant; there was a unanimous "no" to the idea of extending the sewage treatment plant's outfall, and mixed reviews for diluting the harbor's water and the Nottawasaga Bay's water.

Lee Martin of Canadian Steamship Lines said there are "tremendous interest and some good ideas here". But Mr. Martin did say people in general "don't seem to understand the problem". Dr. Krantzberg said the next phase of the public consultation strategy is to schedule a workshop to involve the public more in the RAP process.

### New realm

The PAC decided to investigate the possibility of incorporating itself by the end of the year, resulting in the PAC committee being disbanded.

Ed Houghton, chairperson of the PAC said there are a number of advantages to being incorporated including raising funds from selling RAP T-shirts and other miscellaneous items where at present the PAC can only give away, there would be a more efficient transfer of funds among government organizations, and being incorporated may mean received preferred grants from the government. Lee Martin of Canadian Steamship Lines said before the PAC "jumps right into it" the committee should examine the pros and cons of becoming incorporated.

"There are a lot of implications," he said. "It's a whole new realm." Hamilton Harbour's RAP is incorporated. But there was a general negative feeling about disbanding the PAC group. "This organization has been effective," said Collingwood Mayor Ray Barker. "I wouldn't accept the dismantling of it."

## ENVIRONMENT

# Moving plant's outfall efficient: co-ordinator

By KEVIN WERNER  
The Enterprise-Bulletin

Two environmental tests by the Ontario Ministry of the Environment on Collingwood's harbor have revealed no metal or trace organic contamination in the water and opening up the east and west gaps of the harbor would more effectively dilute the discharge from the sewage treatment plant.

Dr. Gail Krantzberg, Collingwood Harbour Remedial Action Plan (RAP) co-ordinator explained the testing methods during a Public Advisory Committee (PAC) meeting Friday at Cranberry Inn.

She detailed how fresh water mussels were submerged in the harbor for three weeks last summer to see if the canals at Oak and Hickory streets, Black Ash Creek and the harbor's

water contained the presence of potentially toxic polyaromatic hydro-

carbons (PAH), which is detectable in oil and grease residues.

Mussels are used to monitor whether contaminants in aquatic ecosystems are available to animals inhabiting in the ecosystem and entering the foodweb.

Dr. Krantzberg revealed there were elevated levels of zinc found at the Oak Street and Hickory Street Canals and at the Goodyear Outfall.

She said, though, there were no detectable pesticides, organic contaminants, nor traces of PAH in mussels in the areas of the navigation marker in the harbor, at the east harbor by the shipyards, at the STP prechlorination area, and at the west harbor by defunct Imperial Oil.

"The condition of the mussels

found were fine," she said. "The zinc levels that were found could be traced to the former landfill site in the area. We're not sure, but these are preliminary results. But people should not be concerned. The fish in the area are all clean."

Ms. Krantzberg said zinc is an essential nutrient, one that animals can easily absorb.

She said the test was prompted by results obtained in 1988 in which a single sample of fish contained higher PAH levels than background levels. The test with the mussels was

an attempt to validate or disprove the data with a larger sample size.

During the RAP meeting, Dr. Krantzberg also presented a complicated and in-depth visual presentation of computer modelling on Collingwood Harbour's water patterns

factoring in wind speed, and weather conditions based upon worst-case scenarios of how to disperse the Sewage Treatment Plant's discharges.

A cursory explanation by Dr. Krantzberg about the information revealed that moving the Sewage Treatment Plant's outfall outside the harbor would be more efficient in treating the discharge than tertiary treatment.

"There would not be an effect on the harbor," she said.

Another case proposed was if the east wall of the harbor was opened, it would be more effective than tertiary treatment of the STP discharge, but it would temporarily increase the phosphorous count in the harbor, a nutrient contributing to the harbor's algae growth.

The most efficient method of diluting the harbor's water would be to open both the east and west gaps of the harbor, moving the outflow outside the harbor.

"Overall, what the computer models tell us is the harbor has poor circulation, moving the outfall into the bay has no effect upon the water and the harbor does not have a bacterial problem," she said.

## 'Virtual elimination' realistic: PAC

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ing "how clean is clean".

"What do we want to do, restore it before the white man came here?" he asked. In the end the PAC adopted the concept of virtual elimination of discharges into the environment.

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"It makes common sense," said Lee Martin of Canadian Steamship Lines.

## YOUTH

# CCI students 'RAP' with harbor team

The Collingwood Harbour Remedial Action Plan team and Public Advisory Committee set up a display and gathered opinions and suggestions from students at Collingwood Collegiate Monday.

The display showed students what was happening to the harbor's environment and posted blank sheets of paper inviting their comments. It ran throughout the day to get as many students as possible to participate.

Larry Petric, an environment consultant working with the RAP team, said the display was well-received by the students.

"This is to get students involved," he said. "It's their community and the youth here are the ones who are going to benefit from the plan and the ones who are going to pay for it."

Students were asked to fill out a survey to indicate which of the 29 options identified would be appropriate for the harbor. This input will then help the RAP team narrow down the preferred options to clean up the



STUDENT JESSIKA DOWLING, left, listens to RAP team member Josephine Balloi explain the sources of harbor pollution. A display on the team's efforts in cleaning up the harbor was set up at Collingwood Collegiate on Monday.

harbor.

Students were keen to learn about the environmental issues of the har-

bor, he said.

"The students have been giving it a lot of thought," said Mr. Petric.

"They're not just throwing down their answers and taking off."

Grade 13 student Jessika Dowling said it was important for youths to learn about what's happening with the harbor.

"It's just to be more aware of it," she said.

"I'm learning that the major problem is algae and phosphorous pollution," adding that she had assumed before that only industries were contributing to the harbor's mess.

She also pointed out that youth involvement was important in the shaping of the plan.

"You can express your opinion about the different options."

Paul Knox, a geography teacher at the school, said the display was one of the first activities of the school's new Eco-club and coincided with Environment Week.

"It gives students a chance to say what they think about their harbor," he said. "The response was really good."



# New Sewage Treatment Plant Among Harbor Options

By KEVIN WERNER

The consensus of people's opinion during Wednesday evening's Remedial Action Plan (RAP) open house seemed to be saying "a nice display of information but what are you going to do with it?"

"I think it's a direction we have to go in," said Catherine Koepke, a resident of Collingwood since 1978 and one of the 71 people who toured the RAP and Public Advisory Committee (PAC) open house at the town hall.

"We need the ordinary public input and not just the people in the suits. But a lot of these options are band-aid solutions. And the ones that are needed, cost too much. And nobody wants to pay higher taxes for it."

"I think it's about time we finally got this thing out in the open," said Heiga Langer, who has been coming to Collingwood for 35 years. "I would like to see all of the harbor cleaned up."

The PAC held the open house to solicit opinions, comments and input from the public on 29 remedial options contained in the document, "Making Choices: Discussion Paper on Remedial Options", to further clean up Collingwood Harbour.

A number of the options involve the sewage treatment plant (STP) such as building a new one, move the STP or extend the outfall pipe of the STP.

Other options included maintaining and preserving the harbor wetlands, detain flow of Black Ash Creek to allow settling of silt and phosphorus, increase the public awareness campaign to inform the public about the harbor, control use of chemical fertilizers, phosphorus-

containing detergents and grey water discharge from boats.

## AREA OF CONCERN

Collingwood Harbour is listed as one of 42 Areas of Concern around the Great Lakes. The harbor water has been identified as containing excessive amounts of algal growth due to high concentrations of nutrients and phosphorus in the water. One of the main culprits identified of the phosphorus discharges was the STP, which has subsequently instigated a series of environmental measures decreasing its outflow.

Gail Kranzberg, Collingwood Harbour RAP co-ordinator said water clarity and nutrient concentrations have been dramatically reduced since the implementation of a number of preventive measures by the town, the PAC team and various industries.

The PAC held its first meeting November 1988 to draft goals and uses for the harbor water. The PAC said the water quality should not affect the town's drinking water, the harbor should be aesthetically pleasing, the water should support fish and wildlife and the water must meet provincial water quality guidelines.

The PAC decided the harbor should include commercial and industrial uses as well as recreational activities.

A few of the comments addressed the sewage treatment plant and what role it will play in the town's future.

"The sewage treatment plant is a concern," said Ms. Koepke. "A number of the options presented are just too costly. But the options related to educating our students should be a must. Our children are our future."

Ms. Langer said she has had problems with the sewage treatment plant as well.

"They should get rid of the smell or get rid of the sewage treatment plant," she said. "I like Collingwood. I want to stay here permanently. But sewage treatment plant," said Col-

lingwood Collegiate Institute geography teacher Dave Knox. "Whether to have a new plant, or scrap the old plant, I'm also concerned about constructing any type of new walkways in the park area near the sewage treatment plant. It might pose an environmental problem. Overall though, I think having this is pretty good."

## "GOOD IDEA"

Marcel Daigle, technical superintendent at NACAN, agreed organizing an open house to inform the public is a "good idea."

"What I like about this set-up is the people are not pushing any one option on us. They're here to answer questions and to also ask for our opinions to see what we like."

But Mr. Daigle said realistically most of the long-range options available will not occur for the next one to three years, which will not placate the immediate needs of people.

"That's just the way people think," he said. "Look at the number of options available. It's just like Louis 649, pick any combination."

Mr. Daigle believes though, the key to any type of environmental success with the harbor is today's children.

"If this information is introduced to them, they will not debate about it like us, they'll just do it," he said.

Nora McLaughlin, who has lived in Collingwood since before the Second World War, said the number of options presented were too confusing and contradictory.

"It's too much to digest," she said. "You need more time to examine them, at least a few more days."

But she did say the town should develop a new sewage treatment plant and protect the area's wetlands.

"It's a good idea for them to ask us

about it," she said. "I think this public meeting went really well," said PAC Chairperson Ed Houghton. "People wrote comments and asked questions about the process. Some people really wanted to help."

"There was a constant flow of people into the room," said Dr. Kranzberg. "We had a lot of comments. There were a few more options people suggested that we hadn't considered that will be examined. I can't tell you how pleased I am."

## MAKE A DIFFERENCE

Leone Hall of the RAP public awareness committee said she was pleased with the number of people who attended the meeting.

"But for the amount of people living in town, I'm disappointed not more people came out," she said. "But the people who came wrote a stash of comments, that were thoughtful. If only one person did something environmental, it would make a difference. I believe one person can make a difference."

Mr. Houghton said the next stage will be for the PAC to digest the comments and opinions from the people, analyse them, then hammer out the stage 2 document of preferred options, including cost figures beside the options.

"We'll do a cost-benefit analysis and prioritize the options that will include the public's opinion," he said. "The document should be ready by this fall."

Dr. Kranzberg said when the document is completed, the public will once again be asked to comment on it.

"The document 'Making Choices' is still in a draft stage so it can still be changed," she said. "People can still say something about it."



# Making Choices For Our Harbor

Look out over Georgian Bay, and as far as the eye can see is a seemingly bottomless pool of fresh water.

In Canada, a nation boasting a teeming wealth of natural resources, environmentalism has finally taught us to protect, nurture and preserve valuable supplies of water, land and air. For a country with less than one per cent of the world's population, Canada contains an astounding 15 per cent of the world's fresh water surface.

A nice portion (thank you) of fresh water is right at our doorstep in Georgian Bay, part of the Great Lakes system, the largest group of lakes in the world.

A magnet for early human settlement, lakes and rivers possess deep significance in industrial, commercial and recreational uses, some of which were perhaps hazardous to water's delicate ecosystem.

The urgent need to guard our valuable water supply from the enemies of pollution and abuse is stronger now than ever before.

(The World Resources Institute believes fresh water, which is evaporating in global supply, will become in the 1990s what energy was to the 1970s. Canada's commodity has attracted wide attention from the United States and Japan seeking exports.)

Collingwood Harbour, which in 1977 was labelled an "Area of Concern" on the water-quality scale, is on the threshold of "making choices".

Today (March 27), the Collingwood Harbour Remedial Action Plan (RAP) and Public Advisory Committee (PAC) will unveil a list of alternatives to ensure fresh, clear water for future generations. The document "Making Choices: Discussion Paper on Remedial Options" includes 29 recommendations to be presented to the public between 4 and 8 p.m. in the Collingwood Town Hall.

There are some difficult choices to make, requiring substantial financial commitment and renewed co-operation among all residents and harbor users to stem the tide of environmental degradation.

The open house is a continuation of what has been a process, piloted by the environment ministry, with more than a mere splash of public involvement. The strength of the RAP process has been active participation by members of the community who provide local insight on the Public Advisory Committee. Too often when dealing with environmental hearings and assessments, the voice of the public is unheard until the decisions are made somewhere deep within the bureaucratic jungle. (Ontario Hydro please take note.)

The Collingwood Harbour RAP is outrunning other similar programs initiated along the Great Lakes. Its success can be measured by evidence of promising test results in quality and a visible improvement in the harbor.

But there's much more to be done before the harbor loses its 'area-of-concern' status.

How will future development along the waterfront impact water quality? What safeguards must be in place? What steps must individual citizens and the business community take to maintain fresh water quality in the harbor?

No doubt some answers will soon be provided.

# Public Education, Awareness Vital To Harbor, Council Told

By KEVIN WERNER  
of The Enterprise-Bulletin  
It was now time to rap with  
Collingwood council.

After almost three years of discussion, debate and decision-making, Gail Krantzberg, Remedial Action Plan (RAP) co-ordinator, Ed Houghton, chair of the Public Advisory Committee (PAC) and Don Jacques, chair of the public awareness sub-committee of PAC, appeared before council Monday evening to explain who they are, what they have been doing since being organized, and up-date council on Collingwood Harbour's water quality.

Included in the RAP team's strategy was presenting to council its draft discussion paper "Making Choices: Discussion Paper on Remedial Options". 29 remedial options "which would help meet the uses and goals for Collingwood Harbour" to restore the water quality.

"This is the stage where we are beginning to take action," said Ms. Krantzberg. "This is not to say substantial action has not been taking place."

A number of options under consideration by RAP and PAC include building a new sewage treatment plant (STP), extend the outfall of the pipe of the STP, detain flow of Black Ash Creek to allow settling of silt and phosphorus and develop new technology to improve industry's handling of waste.

Both Ms. Krantzberg and Mr. Houghton outlined a brief history of the RAP and PAC groups to council and the public.

In 1977, Collingwood Harbour was identified as an Area Of Concern by the Ontario Ministry of the Environment to the International Joint Commission (IJC).

The IJC, among its other duties, ensures the management of the Great Lakes Water Quality Agreement is maintained. There are 42 designated Areas of Concern around the Great Lakes, 17 of them in Canada.

Since 1986, RAP has undergone testing and monitoring programs to identify the harbor's major water quality problems.

In Nov. 1988, the PAC, consisting of 24 members of various area interest groups, met for the first time with a three-prong mandate: to provide public input into the development of the RAP process, particularly in determining use goals for the harbor and selecting remedial actions for achieving these goals; to assist in getting the RAP message out to the community and to serve as a basis for generating public support for implementing the remedial actions.

## REMEDIAL OPTIONS

"This is very critical," said Ms. Krantzberg. "The PAC will determine the future direction of where the Collingwood Harbour wants to go. The 29 remedial options is to restore water quality to the harbor."

Ms. Krantzberg said Collingwood Harbour had an "excessive nutrient" problem which resulted in the harbor being "choked up with algal growth".

She said 90 per cent of the problem stemmed from the Collingwood Sewage Treatment Plant, which discharged the phosphorus into the harbor.

"Now there is a noticeable improvement in the water quality of the harbor that some people have said they can never historically remember it being," said Ms. Krantzberg.

She said after soliciting comments from councillors about the discussion paper, and after a public meeting, to be held March 27, from 4 to 8 p.m. where the community can provide their input on the discussion paper,

the RAP team will begin selecting their preferred options, thereby transforming the discussion paper into an "action plan" that will implement the selected options.

"The community is so central to the process," said Ms. Krantzberg. "It's then up to the RAP committee and PAC to synthesize the discussion paper."

But Ms. Krantzberg emphasized community awareness programs have been undertaken to make the public informed about the harbor.

She noted the success of the EnviroPark idea with government and private individuals, so much so that funding has been accepted from Ronald McDonald House (\$20,000), Environment Canada (\$17,000) and recently the Water Resource Branch of the provincial ministry of Ontario (\$20,000).

Also on the drawing board is the proposed dredging of the harbor's sediment "removing traces of contamination" and storing it in a container nearby, she said.

Mr. Jacques described an assortment of events and activities that have occurred to focus attention on the harbor such as the two Harbour Days held in 1990 and 1988, which were "very successful".

## COMMITTEE MANDATE

"The public has to be involved and the public has to be made aware of the situation," said Mr. Jacques in detailing his committee's mandate.

"Changing people's behavioral is essential to restoring the harbor's water."

He said the RAP's fifth newsletter has been sent out to the area's households updating the community about RAP's discussion paper; they are in the process of creating environmental kits for teachers to use; posters of the harbor outlining how water drains into the harbor, and periodic RAP informational updates in the local media.

"We want to control the use of detergents and fertilizers by the community and to also make the boating

population aware of the situation," said Mr. Jacques.

But the question permeating throughout the minds of everybody present was when will Collingwood Harbour be delisted from being an Area of Concern.

Ms. Krantzberg said it is a "very interesting issue" for the RAP team to consider since Collingwood Harbour may be "the first Area of Concern to approach the province to be delisted."

She said a number of factors are needed for the harbor to be delisted: to meet the RAP's beneficial uses goals, to which Ms. Krantzberg said the harbor accomplished in 1989 and 1990 with the phosphorus levels in the water below provincial averages and meet the standards set out by the IJC, the federal and provincial governments.

"We would like to produce the discussion document into a delisting document," she said. "The harbour is as clean now as it's ever been."

Council was effective in their appreciation of the RAP and PAC teams' presentation and efforts.

"The RAP is working," said Collingwood Mayor Ray Barker who also sits on the PAC committee. "There is still a long road ahead. But keep up the good work."

Councillor Greta Gill was complimentary towards Mr. Jacques' public awareness sub-committee saying she has a Collingwood Harbour poster hanging on a wall in her office.

Reeve James Belcher, a member of Great Lakes United, an environmental group, said RAP and PAC have done a "magnificent job".

"It's important for people to realize phosphorus, such as in fertilizers go into the harbor," said Reeve Belcher.

"It's important we have input from the public," said Deputy-Reeve Doug Garbutt who also represents industry on the PAC. "It's been three years. We're that close."

Enterprise Bulletin, March 20/91

EB March 20/1991

# Government May Use Dredging Equipment

Collingwood Harbour is under consideration to be a guinea pig by the federal government.

Gail Krantzberg, Collingwood Harbour Remedial Action (RAP) co-ordinator, said the harbor is being examined as a demonstration site for the use of new dredging technologies.

She said the federal government is interested in testing the technologies in order to safely remove contaminant sediments from the harbor.

"The harbor's sediments are not toxic anywhere," Dr. Krantzberg emphasized. "This will be a demonstration project. The government wants to use their equipment on safe sediment instead of contaminant sediment in case something goes wrong."

She said a number of benefits will result from the dredging operation such as it will assist all 42 RAPs in cleaning up their Areas of Concern around the Great Lakes; the disposal facility situated by the Collingwood Terminals will be filled and capped; the harbor will be deeper thereby allowing easier navigation by ships, and the traces of contaminated silt in the harbor will be removed.

Dr. Krantzberg acknowledged contaminated soil is present in the Canadian Steamship Lines' slips.

"But it's not moving," she said. "It will have to be dealt with in the future if the area is developed."

She said one-third of funding will come from the federal Clean-up Fund, another third is from the provincial research and tech-

nology fund, and the other third of the cost is still being organized.

Public Advisory Committee Chairman Ed Houghton said if "everything falls into place" dredging operations should begin sometime in the fall of 1991.

Dr. Krantzberg said having the harbor dredged will facilitate getting the harbor delisted from the Areas of Concern.

"And that's what we're working towards," she said.

Mr. Houghton also mentioned a number of other on-going initiatives the PAC is working on.

This spring, Black Ash, Oak and Hickory streets are being tested for water quality, "but most of the substance is silt at this time of year".

"We will get another chance though, to test the water quality of the harbor during the summer when it rains," he said. "Our results from the previous two years have been good, but they don't include as much statistics about the effects of rain run-off as we would like. It could change the results. After the third time we should know what will happen."

And depending on when the RAP's Stage 2 document is finalized outlining the prioritized remedial options, probably in the fall, 1991, Don Jacques, chairperson of the PAC's public awareness committee said the next Harbour Day will occur in the summer of 1992.

"We'll definitely have one in 1992 and hopefully it will also be a celebrating of Collingwood being delisted," he said.



# RAP Paper Sets Plan To Protect Town Harbor

BY KEVIN WERNER

Of The Enterprise-Bulletin

A "preliminary draft" discussion paper detailing the options to "improve and protect" Collingwood Harbour was presented to Collingwood's Remedial Action Plan (RAP) meeting, Friday morning.

Gail Krantzberg, RAP coordinator said the public advisory committee (PAC), "were pleased with the document".

"They thought it was very useful in order to examine the various options available, and it will give the members a chance to look at the overall structure of the document," she said.

The discussion paper outlines 25 options, 15 classified as "technical", and the other 10 categorized as "non-technical" choices that should be debated to improve Collingwood Harbour.

The technical options are subdivided into three sections, those dealing with improving the sewage treatment plant, remedies that control up-the-pipe from the sewage treatment plant and options dealing with

the harbor itself.

The non-technical options are divided into those that involve public education and choices designed to encourage modification in people's behavior.

Options under examination in the technical classification include modifying the current sewage treatment outfall to better dilute the effluent, construct a detention pond for sewage treatment upsets, move the sewage treatment plant, construct composting toilets to reduce loading on the the sewage treatment plant, construct a detention pond in Black Ash Creek to reduce nutrient and silt loading, increase the exchange of water with the water of Nottawasage Bay, take no action, but monitor the harbor to see if time will heal the problem.

The non-technical options, some of which have already been implemented, or are in the advance stages of being executed, include the construction of an environmental playground, a public awareness cam-

— CONTINUED ON PAGE 2

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aign, an environmental library, controlling detergents and fertilizers, agriculture programs and water conservation.

## WATER IMPROVES

Since 1977 and when the International Joint Commission designated the Collingwood Harbour as an area of concern, water quality has improved because of "reduced industrial use of the harbor and better efficient use of waste handling at the sewage treatment plant".

The primary cause for concern has been the level of nutrients, particularly of phosphorus in the harbor's waters. The high nutrient concentrations results in nuisance algae growth "impairing the esthetic and recreational enjoyment of the harbor".

It has been known the sewage treatment plant is the largest contributor of nutrients to the harbor's water. Other problems include poor water clarity, bacteria levels following storm events, which so far this summer have been kept under control, and the contamination of harbor sediment within the former site of the Collingwood Shipyard.

At the January 17, 1990, RAP meeting, the public advisory committee (PAC) detailed the goals and uses for the harbor.

Goals included the harbor water should be used for passive recreational use, that fish and wildlife levels within the harbor are sustained, water quality should meet provincial bacteriological guidelines for body contact.

The uses described by the PAC committee include continued disposal of sewage treatment plant effluent, boating activities, sport and

ice fishing, nature observation and a full service marina.

The preliminary draft discussion paper on remedial options was constructed to address the goals and uses of the harbor.

Despite the introduction of the document to the committee, Ms. Krantzberg said a number of the non-technical choices have already been decided upon and are being enacted.

Don Jaques, of Canadian Mist Distillers Ltd., informed the PAC meeting of the public awareness campaign that is underway within the Collingwood area. He pointed out the RAP column, which explained what the organization is and the issues they are dealing with, which appeared in The Enterprise-Bulletin, the construction of the RAP sign on the road leading to the harbor, the establishment of environmental teaching aides for area schools including a "useful and up-to-date overview map of Collingwood" to gauge the area's water inflow and outflow, an information centre targeting education for boat owners on how to be environmentally conscious, the organization of an environmental book section at both Collingwood Collegiate Institute and the Collingwood Public Library and the recent announcement of funding for a environmental park to be constructed in Harbourview Park.

"That was very good news we received," said Ms. Krantzberg. "We will be receiving about \$17,000 seed money to begin the design phased of the project."

In the remedial option discussion paper, the enviropark option was outlined to take three years to be

developed. Construction costs was estimated at \$167,000. The cost could be met by the joint funding of the federal Great Lakes Cleanup Fund, the municipality, local businesses and other sources.

"We're past the discussion phase. Now we're in the action part of our program," said Ms. Krantzberg. "The harbor sign, the public awareness campaign, the environment park, these are to raise the public's action, to get them involved in what we're doing."

She said implementing the non-technical options can be done quickly and will have an immediate impact

on the community.

"The technical options are slower to choose and they cost money to develop. But that is the point of having this discussion paper," She said.

She said the document will be debated at the next PAC meeting scheduled for September 11. A final draft of the remedial options will be presented to the RAP steering committee. Then an open house will be organized in the fall, or early winter, to receive public input on the technical options that are being offered.

For more from this meeting see page 1B of this newspaper.

# Harbor Blueprint Set For Release

By JAMES IP  
of The Enterprise-Bulletin

The Collingwood Harbour Public Advisory Committee (PAC) will be holding an open house next month as it prepares to finalize its long-awaited discussion paper on ways to clean up the waterfront.

The PAC is scheduled to present its Remedial Action Plan (RAP) discussion paper bearing 29 options to Collingwood town council on March 18 and then hold a public open house tentatively scheduled for the following Wednesday, on March 27 from 4 to 8 p.m. in the council chambers.

The committee's discussion paper will be released then for public input before PAC takes a stand on what the preferred options are for its RAP strategies, hopefully by the end of this summer, said RAP co-ordinator Gail Krantzberg.

"People will be coming in wanting to learn about the option paper," she said.

It was also moved at the meeting that the committee would be consulted by the RAP team to prepare the list of preferred options document.

But the committee's work is not yet done as it met last week to discuss ways to effectively implement its plan and to set goals for the delisting of Collingwood's harbor as an area of

environmental concern.

Delisting refers to the removal of an Area of Concern designation assigned by federal and provincial bodies as well as by the International Joint Commission.

The committee was told that criteria for delisting are developed by the government in consultation with the local PAC as well as Collingwood's RAP team.

Various guidelines are set by the agencies and the PAC will adopt these guidelines for delisting Collingwood Harbour, said Ms. Krantzberg, helping the committee speed up the process.

For example, an area can be delisted if it can be proven that heavy metals found in the sediment of the harbor do not exceed the maximum allowance. In Collingwood's case, Ms. Krantzberg said although the copper concentration may exceed the guidelines, it is due to natural causes and not from man-made sources, thus there is no need to control the concentration of the metal.

There are currently 42 locations on the Great Lakes designated as environmental "hot spots" under the Great Lakes Water Quality Agreement. The government is continuing to work with local PACs to develop remedial action plans in an effort to

clean up the waters for future generations.

Ms. Krantzberg stressed that goals of the RAP should specify quantifiable targets to which delisting could be assessed. Such targets should be a part of the RAP document.

Once the Canadian and Ontario agencies approve that RAP's goals have been met, Collingwood Harbour will be delisted, regardless of what the International Joint Commission (an organization dealing with environmental issues common to Canada and the United States along their borders) approves, said Ms. Krantzberg, although the IJC guidelines will also be considered in the RAP.

Agreements between the PAC and the provincial and federal governments to implement RAP strategies

will have to be negotiated after the paper on preferred options is drawn up, said Ms. Krantzberg, adding that the province will have the biggest role in leading the negotiations.

She said that once Collingwood decides what the preferred options are, implementation of specific goals will be much easier.

Meanwhile, a sub-committee has been making headway towards a public education strategy.

Don Jacques, speaking for the public awareness sub-committee advised that posters will be distributed to area schools to educate youngsters of what is happening with Collingwood's harbor and the RAP.

Also, a teacher guide for the high school level will be written by a hired consultant through the Ministry of Environment.



# Reducing Harbor's 'Grey' Water

Leone Hall, vice-chair of the public awareness sub-committee and a public representative of the Public Advisory Committee (PAC) told Remedial Action Plan (RAP) members, last Friday (Dec. 14), about informing the public about grey water and its effects upon Collingwood Harbour.

Grey water includes waste water from washing hands, hair, dishes and clothing, effluent from showers, bilge and washing down boat decks. Speaking to RAP members at the Cranberry Inn, she said grey water may contribute to pollution in a number of ways: bilge discharge may contain oil, phosphate which contributes to algae and bacteria growth, and dirt particles that reduce water clarity.

RAP has said a number of actions can be done to reduce grey water. For instance, encourage marinas to build pump out stations, ask boat manufacturers to construct grey water tanks in boats, pass provincial legislation making it illegal for boaters to possess detergents that contain phosphates, and begin a public information campaign to educate boaters about the problems of grey water.

She said in Georgian Bay Township, a grey water bylaw was passed making it illegal to discharge grey water overboard to the tune of \$2,000.

## MUSSEL ATTACK

Collingwood had better be ready for The Attack of the Zebra Mussels. Gail Krantzberg, Collingwood RAP Co-ordinator with Environment Ontario said zebra mussels have been sighted in Georgian Bay, at Tobermory, and Bruce Nuclear Power Plant. She said to date no method has been found to prevent the mussels from wreaking havoc on pleasure craft, water in-take pipes or sewage treatment plants. She said several companies including "Team Zebra" feature biodegradable products to guard against zebra mussels. Waxes, rinses and biodegradable cleaners are being promoted to clean the mussels once they attach themselves to a surface. Ms. Krantzberg said though, "there is no product currently recommended to get rid zebra mussels". "It's a very new field," she said. Attempting to do something about it, Ontario Hydro is part of a provincial committee examining the problem. Ed Houghton, PAC Chairperson, and

operations manager of the Collingwood Public Utilities Commission said the Soviet Union has tried everything to combat its zebra mussel infestation, using such methods as chlorine, hot water, vibrations and electric shocks. "They said the best way though to combat zebra mussels is to learn to live with them," said Mr. Houghton adding the CPUC has allocated \$20,000 for 1991 in order to do a study on the problem. "They're coming here. So we'd better learn to live with them also."

## ENVIROPARK

The RAP meeting took some time out to talk about Collingwood's proposed EnviroPark. Ben Bennett, community liaison officer on the public advisory committee for the Georgian Triangle Waste Management Master Plan said there has been "a great deal of interest" generated by the park in Toronto and around Georgian Bay

basin. He said so far a number of corporate sponsors such as Shell Canada, McDonald's, Molson's, and Canada Trust have donated funds toward construction of the project. "We have spoken to the Rotary Club and they said maybe next year," said Mr. Bennett. "If not them, we'll go to the Optimist Club." He said they will be accessing funds from Environment Canada to see if the EnviroPark qualifies. There was a question as to who should take credit for the EnviroPark idea. Ms. Krantzberg, as well as the rest of the PAC members, acknowledged Mr. Bennett as the creator. "All I know is the EnviroPark idea is taking off," said Mr. Bennett. "I don't care who gets the credit."

## EATING FISH

Ms. Krantzberg said it was "irresponsible" for people to come out and say don't eat any of the fish in the Great Lakes. A scientist, John Leatherland, at the University of Guelph was quoted as saying Ontario's consumption guidelines underestimates the danger from toxic chemicals in fish. Mr. Leatherland was quoted that one meal of coho salmon taken from Lake Ontario contains as much PCBs, dioxins and other organic chemicals as 1.6 million gallons of untreated Great Lakes water. "In some places of the Great Lakes that information is true," she said. "But we have sport fishing organizations measuring the fastest, oldest and largest fish in Georgian Bay and they have not found anything," she said.

## GOOD QUESTION

Don Green, environmental services co-ordinator for the town of Collingwood, asked the \$64,000 question, at the RAP meeting: when will Collingwood Harbour be delisted from the Great Lakes Toxic "Hot Spots"? Ms. Krantzberg said if the RAP team presents information to the Great Lakes Joint Commission, revealing the water in Collingwood Harbour exceeds the provincial guidelines and there is a restoration of beneficial uses "and shows we have restored those uses, then yes we have met the delisting criteria". "If it meets provincial objectives, and the restoration of uses does not impair the harbor we take it to the coalition to get it delisted," she said. But Mr. Houghton cautioned the PAC membership saying he "didn't want to build this (delisting) thing up to a crescendo".

## IN COLLINGWOOD HARBOUR

# Water Quality Within Guidelines

By KEVIN WERNER  
of The Enterprise-Bulletin

Despite higher chemical findings after another season of water quality testing in the Collingwood Harbour, water continues to be within the guidelines set out by the Ontario government.

During a Remedial Action Plan (RAP) meeting Friday at Cranberry Inn, Gail Krantzberg, Collingwood RAP co-ordinator presented the ministry of environment's test results from its March to November water quality testing.

Displaying graphs and charts, Ms. Krantzberg told the members of the Public Advisory Committee (PAC) there were higher phosphorus concentration counts being discharged by the Collingwood Sewage Treatment Plant and Hickory, Oak and Black Ash creeks in their 1990 test results compared to the 1989 tests. "The phosphorus concentrations — almost twice the amount in 1990 as 1989 — were higher this year because there were higher flows; almost twice as much as last year," she said, adding the flows were higher because of a wet 1990 summer season.

She said this was a "significant" result because the tests are still "well below ministry of the environment standards".

Ms. Krantzberg cautioned the results are "fairly preliminary" meaning there is a margin of error in the tests.

She said charts reveal the major difference in the phosphorus concentrations occurred toward the end of the 1990 season.

"There was a gradual build-up of nutrients in the season beginning in mid-August, continuing through September, October and into November," she said.

The test results, from markers strategically scattered throughout the harbor, showed there were no water quality problems in the western basin, while in the northern part of the harbor, Ms. Krantzberg said "you don't have a nutrient problem there."

"The main source of peaking (higher phosphorus concentrations displayed on graphs) is directly related to rainfall," she said. "Despite the rains, though, the harbor does not have a bacteria concentration problem."

### MAIN CONTRIBUTOR

As the results revealed, the main contributor to the increased phosphorus concentration to the harbor is

the Sewage Treatment Plant (STP) — 96 per cent — while Hickory, Black Ash and Oak creeks contribute 4.1 per cent of the phosphorus concentrations.

As a comparison, the harbor's average water quality results in 1990 are "remarkable" compared to 1986 results where the harbor's water quality would have been "off the graph". In 1970, the results would have been "four times than what we are now", Ms. Krantzberg said.

Jim Kilgour, the education rep-

resentative on the PAC said "there is still the perception out there that the harbor is still dirty".

"We have to show them these graphs to tell them there has been a hell of a lot of improvement in the harbor's water," he said.

PAC Chairperson Ed Houghton, operations manager of the Collingwood Public Utilities Commission, disagreed with Mr. Kilgour's assessment, saying "a lot of people in the community know the harbor is being

cleaned up".

Ms. Krantzberg said that previous years people could not see a difference in the harbor's water quality. But as witnessed this summer, particularly during Harbour Day, Ms. Krantzberg said people have been able to see the improvement in the harbor's water.

"It shows we're doing something," she said. "We just have to push it more."

The discussion then turned to how the STP and the creeks can reduce their phosphorus concentrations even more.

Don Green, Collingwood's Environmental Services Co-ordinator, told the meeting, he "didn't know how much more we can go" towards reducing the phosphorus concentrations.

"It will cost us and the town a lot of money," he said.

### CAPACITY INCREASE

Presently, the STP is being studied in order to determine how to increase the plant's capacity.

Doug Garbutt, plant manager of NACAN, said if the costs of decreasing phosphorus concentrations from his plant and Canadian Mist increase "we'll have to go elsewhere for our business".

There was also the question of the impact upon the harbor as the town upgrades its storm sewers.

Deputy-Reeve Ray Barker said with Second Street targeted next year for upgrading, he asked what will the water runoff do to the harbor.

Ms. Krantzberg said it "shouldn't make a major difference on the harbor". But, she said, the PAC should still concentrate on reducing phosphorus loads that are going into the harbor.

## 'Making Choices' One Of Plan's Final Stages

So, where does it go from here?

In 1986, Collingwood's Remedial Action Plan (RAP) was designed by the Ontario Ministry of the Environment in response to Collingwood Harbour being designated an Area of Concern in 1977.

Extensive testing and monitoring programs to identify the harbor's major water quality problems have been implemented since 1986.

In November 1988, the Collingwood Public Advisory Committee, made up of various area interest groups, met for the first time to do three things: to provide public input into the development of the Collingwood RAP; a public relations goal to get the message out to the community; and to generate public support for the remedial actions.

During Friday's RAP meeting at Cranberry Inn, the PAC went over with a fine tooth comb, page by page, and word by word, the Collingwood Harbour RAP team's discussion paper "Making Choices: Discussion Paper on Remedial Options".

It was one of the final stages of the RAP process outlining various remedial options to improve the harbor before allowing the discussion paper, which has been under construction since November 1988, to be reviewed by the public.

After the discussion paper has been reviewed by the PAC members, it will be sent to the RAP steering committee for discussion.

Once the PAC receives the steering committee's comments, the

PAC decided to approach Collingwood council to explain the contents and purpose of the discussion paper.

Early in the new year, PAC will conduct an open house/workshop for the public in order for the discussion paper to be critiqued by the community.

After the public input has been received and digested by the PAC, they will begin the arduous process of prioritizing the remedial options of the discussion paper.

Once a preferred options document has been hammered out, a public meeting will be organized, again, to solicit the community's comments about the feasibility of implementing the options.

Gail Krantzberg, Collingwood RAP co-ordinator and Environment Ontario official said the process "will take us into spring".

## Collingwood Park To Benefit From Brooker Ski Challenge

TORONTO — Many attending the press conference announcing the sixth annual Tood Brooker Ski Challenge, Thursday at Molson's office, had trouble thinking snow and skiing.

The temperature in this city, at noon, was almost 19C degrees. But that was fine as far as the delegation from Collingwood was concerned, because it had something it wanted to display.

That something was two drawings of the town's proposed enviro-park which is planned to be placed in Harborview Park next spring.

The idea for the park caught the eyes and ears of the organizing committee of the Brooker challenge, and in an effort to put something back into the community, and area, which hosts the event, will give \$20,000 towards the development of the idea from this year's event.

### TO HELP TOWN

George Mencke, president, Ronald McDonald Children's Charities of Canada, made the announcement of the donation to the town's park program.

"This year we are making a contribution to a children's program in Collingwood. Collingwood wants to build a park at the entrance to the Georgian Trail which will mainstream physically

and mentally-challenged children with other kids. It will be playground and nature trail which will include exhibits and trail on the environment. We see this as a very worthwhile cause and we are also putting money back into a community where we run a very

successful charity event.

"Peter Dunbar (Collingwood's recreational director) is with us today. He is next to a drawing of the park. Peter, we would like to congratulate and your organization on this outstanding project," said the president.

With Dunbar was Ed Houghton, Gail Krantzberg and Rob Ratnay.

Mr. Dunbar said this is a "fantastic show of support" and shows that the idea is a good one and that the committee working on this park is on the right track.

The enviro-park will be created by adapting an existing play area in the town's Harborview Park. The park aims to teach children how everyday things in their lives have a direct impact on the environment.

"The special Ronald McDonald Charities \$20,000 contribution will ensure full access to the park by all physically challenged children. The play area will be fully integrated allowing children with physical limitations to play in the park along side their friends," said Dunbar.

The idea for the McDonald Charities to make a donation to this park came from former national ski team champion Todd Brooker, said Mencke.

"The enviro-park in Collingwood will be getting part of the funds from the race. It is a state-of-the-art park that is unique to anywhere else in Canada. I believe, living in Collingwood myself, that it is time we did something for the home of the ski challenge. I think it is terrific that we are giving back something to the town, something that will be meaningful for able-bodied kids as well as physically handicapped," said Brooker.

Brooker announced the date of the challenge will be on March 5. In talking about the event he said more than 300 skiers take part each year.

"Do you realize that after five

years this is our million-dollar year, we are surpassing a million dollars in funds," said Brooker.

Brooker talked about the day's activities including a continental breakfast reception, ski clinics hosted by himself and other celebrity skiers, the challenge, barbecue luncheon, cocktail reception and awards dinner.

"In addition, all participants will receive a variety of sponsored prizes and will have the opportunity to bid on some fabulous, fantasy-auction prizes during a live auction," said Brooker.

Jim Kirby, a former national ski team member, talked about an event which will be held the day before the challenge.

"To supplement the fund-raising efforts of the Brooker Challenge, Xerox will be hosting a special celebrity ski clinic at Blue Mountain on March 4. All Tood Brooker Ski Challenge participants are invited to perfect their racing techniques at the one-day camp. Net proceeds raised will be donated to the ski challenge," said Kirby.

He said that besides himself and Brooker, Laurie Graham, Karen Stemmler and others would be conducting the clinic.

For more information, or to register for either the clinic or the challenge, one can contact Melanie Cramp at (416) 365-7200 or fax her at (416) 365-7941.



GEORGE MENCKE, president of Ronald McDonald Children's Charities of Canada, left, gets information about the new enviro-park slated for Collingwood from the town's recreational director,

Peter Dunbar, second from left. Also attending the press conference in Toronto were Ed Houghton and Gail Krantzberg, right, who are working with the new park's committee.



# PAC Examines Options For Collingwood Harbour

By KEVIN WERNER  
of The Enterprise-Bulletin  
The Public Advisory Committee (PAC) evaluated the 15 technical options previously put forward by Collingwood's Remedial Action Plan in their draft discussion paper, Tuesday afternoon.

Without advising any concrete decisions, the PAC methodically discussed the advantages and disadvantages to implementing the various options that will address Collingwood Harbour's water quality.

Dave Evans, consultant for the COA/RAP Steering Committee, a middle management that oversees the 17 PACS in Ontario which are dealing with their respective areas of concern, had difficulty with defining what options should be held under discussion.

Mr. Evans questioned whether the option to modify the outflow (Lee Martin of the Collingwood Shipyards advised the word "modified" be changed to "relocate"), as well as the option to increase the exchange of harbor water with the water from Nottawasaga Bay, should be dropped from the option category. This prompted a number of exchanges, views and opinions among the representatives as to what the definition of these options were and how relevant they would be for public discussion.

"What impact will it (modifying the outflow of sewage from Collingwood's Sewage Treatment Plant) have on the ecosystem?" he asked. "The option does nothing to reduce the pollution. It's a short-term solution. You're diluting the sewage. It's not what the ministry is willing to accept. It's moving one pollution problem to another area. This should not be entertained. This is not an option."

## DISCUSSION PAPER

Ed Houghton, operating manager of the Collingwood Public Utilities Commission and PAC chairman replied these type of options must be included in the overall draft discussion paper for the public's benefit. "It has to be there, it's in our mandate."

Larry Hogarth of the Collingwood Yacht Club said it was an option because "it fixes the harbor, even though it is a short-term solution."

"We should say though in our report that it will adversely affect Nottawasaga Bay."

As well, Gail Krantzberg, RAP co-ordinator, said it wasn't a solution to the overall pollution problem.

The next option discussed was constructing a detention pond for raw sewage treatment plant upsets. Mr. Houghton said it was an "inexpensive" choice while Jim Kilgour from Collingwood Collegiate Institute said a detention pond was "unnecessary". Half in jest, Mr. Kilgour said there would be a "big hole" constructed.

"Why not make a wetland out of it?" He said a wetland would act as a natural filtration system purifying the sewage, with water hyacinths growing out of the silt, and the sediments lodging at the bottom of the wetlands.

## EXPENSIVE OPTION

Wes Lammers, special projects co-ordinator of the ministry of environment for the Central Region said the most expensive option was mov-

ing the sewage treatment plant from where it is now, to along the waters of Nottawasaga Bay.

"There will have to be an impact study done if this option was accepted," said Ms. Krantzberg.

Mr. Martin, pointed out that while travelling to Austin, Texas, recently, a city with a population of about 125,000 and a number of industries, "their sewage treatment plant's outflow was discharging into a creek six foot wide and five-foot deep, and the water was very clear. I can say there would be no detrimental effects to Nottawasaga Bay. We can lay to rest that the bay would be contaminated."

But he advised the cost of the option would be "about \$50 million, with an increase in land values also occurring."

"So in my opinion this option isn't justified."

Mr. Kilgour said in conjunction with transferring the harbor and bay waters would be to reduce the phosphorous levels in the water.

"During slight off-shore winds, for the first time in my life I could see the bottom of the harbor, the clarity was that good. I'm no pro for this choice but I would like to see some numbers. What I saw was really something."

Other preferences that were considered during the meeting at Cranberry Inn were pre-treatment facilities to remove phosphorous and other nutrients prior to flowing through the sewage treatment plant, an option that NACAN and Canadian Mist are presently undertaking, said Mr. Kilgour.

## NEW TECHNOLOGY

The option to adopt new technology was greeted with mild acceptance. Ms. Krantzberg said this choice "opens a door for some engineering genius to come through." While Laurie Arron, assistant development officer with Canadian National Real Estate Immeubles said there were biological pilot programs in place that "may be quite the panacea" for breaking down sewage waste.

"It leaves pure water with no sludge."

Options such as dosing (applying water with alum or other chemicals to remove phosphorous), tertiary treatment (installing tertiary treatment at the sewage treatment plant to eliminate phosphorous) and wetland restorations were discussed.

Alex Smith, fish and wildlife supervisor of the ministry of natural resources Huronia District office said the choice to construct a detention pond or a similar structure in Black Ash Creek would result in a problem with fishes gathering at the bottom of the barrier.

"Not all fish know where their home is," he said, but added the option "might work out nicely."

Mr. Kilgour wanted to see some action on the issue of confined-storage of sediment and the sucker dredging of the harbour.

"Let's get the bloody thing done." To which, Mrs. Krantzberg reminded the PAC this particular option was not part of their mandate. Still, she reassured Mr. Kilgour the ministry "would definitely get on that".

The last option to be considered was the monitor, or the "do nothing" choice, a preference Mr. Evans sug-

gested should be re-defined. He said it should be explained in the context of doing nothing until the ministry of the environment upgrades its requirements, "and not in the absence of any change in its requirements."

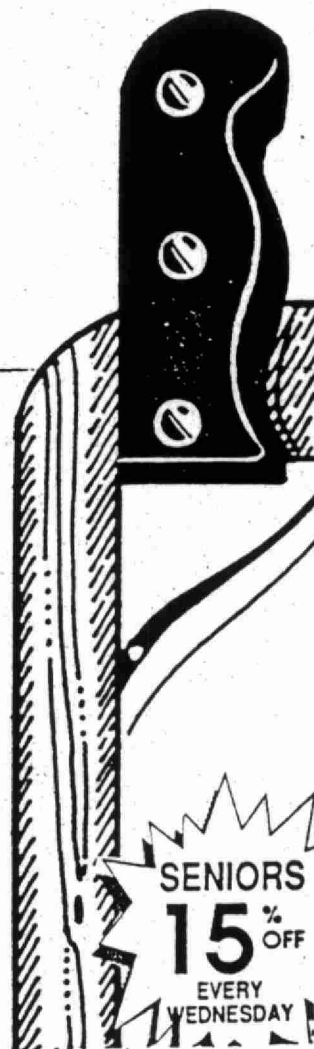
Mr. Krantzberg reminded the PAC a few of the "non-technical" options have been organized such as the installation of an environmental library at the Collingwood Library, and the RAP communication plan.

## PROVIDE GUIDELINES

The technical and non-technical options provide guidelines which the Collingwood community can consider in resolving the water-quality problems of Collingwood Harbour.

Once the PAC and RAP have discussed the suitability of the remedial options, they will be introduced to the public for a formal discussion.

The PAC meeting was held amidst the Annual RAP Co-ordinators three-day meeting being held at Cranberry Inn. Over the days, RAP co-ordinators debated strategies for the Great Lakes clean-up program that is being implemented at the 17 Ontario 'areas of concern' (AOCs).



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# Harbour Day 1990 Set For Saturday

Harbour Day is an opportunity for Collingwood residents and visitors to learn more about Collingwood Harbour and plans to improve harbor water quality. It is hosted by the Canada-Ontario Collingwood Harbour Remedial Action Plan (RAP) team jointly with the Public Advisory Committee (PAC). The Town of Collingwood, local businesses, artists, environmental groups, students and others have also been invited to participate. The entire event is free.

Harbour Day was also held in 1988. More than 300 people visited displays set up by the RAP, businesses and organizations, the town, and participated in a variety of events. Harbour Day was successful in increasing awareness of harbor issues and the RAP process.

Harbour Day will take place on August 25, 1990, from 12 noon to 5 p.m., by the town dock on the grain elevator pier. The RAP team will provide a large tent where displays will be set up in case of poor weather, allowing the event to proceed rain or shine. Businesses throughout town are encouraged to participate in Harbour Day by setting up displays in their stores celebrating the harbour.

There will be five major activities at the Harbour Day site:

## MANY DISPLAYS

Local businesses and organizations will be setting up displays showing harbor history, uses for the harbor, how they are contributing to a better harbor ecosystem or how members of the public can improve the environment.

Here is a selection of some of the displays: Canadian Mist Distillers -- overview of plant process and water use; Art Group of Collingwood -- modern and historical landscapes of Collingwood Harbour; Nacan Products -- the starch-making process and water treatment system flow-chart; Water Pollution Control Plant

and Town of Collingwood Environmental Services; Collingwood Terminals -- the history of the terminals; Blue Mountain Power and Sail Squadron -- safe boating is clean boating; Collingwood Museum -- history of our harbor; Collingwood Public Utilities Commission -- water conservation devices; Senior League of Collingwood -- how conservation activities improve water quality; Georgian Triangle Waste Management Master Plan -- composting and waste reduction; RAP team/PAC -- the RAP, the PAC, and our harbor; Lifestyles Health Food Store -- harbor-friendly cleaning products; Ontario Ministry of Natural Resources -- zebra mussels (tentative); Cranberry Marina -- scale model of marina, efforts to keep the marina waters clean.

Public Focus, a non-profit organization devoted to environmental education, will again be bringing environmental games for kids to play and have fun while learning about the environment. Games will include: Environmental Detective, Acid Rain Fish Pond, Toxics in the Home, Pond Foodweb. These environmental games were very popular with the public at Harbour Day in 1988, and they have been used in Ontario, Quebec and British Columbia.

Young participants in Harbour Day will be encouraged to bring their art which relates to Collingwood

Harbour. Or, they will be able to create their art down by the harbour during the event, and even help create a large harbour mural. Everyone wins at this event, as participants will receive RAP buttons and fridge magnets.

## BOAT TOURS

RAP team and PAC members will act as guides for a 20-minute tour of the harbor highlighting areas of interest to the RAP and explaining some of the options for improving water quality. This was very popular in 1988, so come early to insure a passage on one of ten trips...

## ENVIRONMENTAL ARTISTS

Artists will display some of their artwork which shows the harbour and other waters of the area, reminding us of the beauty to be found so close to home.

Bring your friends and children down for the afternoon and help

celebrate Collingwood Harbour and our environment!

For more information on Harbour Day, contact either Josephine Balloi at (705) 444-2500, or Gail Krantzberg, RAP co-ordinator, Environment Ontario (416) 323-4956 (collect).

## DENTURE THERAPY CLINIC

G.C. SPIERS

**445-7700**

NOW LOCATED AT:  
22 Second St., Collingwood

# Collingwood Harbour Day

Collingwood will celebrate "Harbour Day" on Aug. 25.

Displays by local industries and organizations will be set up, including Canadian Mist Distillers, Ag Group of Collingwood, Nacan Products, Collingwood Museum, Collingwood Public Utilities Commission, Georgian Triangle Waste Management

Master Plan and Cranberry Marina, to name but a few.

Children will be able to take part in environmental games such as environmental detective, acid rain fish pond and pond foodweb. Children are also encouraged to bring their own which relates to Collingwood Harbour, or create their own art there or participate in creating a large

mural.

Boat tours will also cruise the harbor and guides will explain some options for improving water quality.

The day is an opportunity for area residents and visitors to learn more about the harbor and plans to improve harbor water quality.

The first Harbour Day was held in 1988.

Enterprise Bulletin August 1990



## HARBOUR DAY'S BIG SPLASH

Giving the 'thumbs up' sign before making a big splash in Collingwood Harbour during Harbour Day festivities, Saturday afternoon, is 10-year-old Tyler Skillen, while behind him is his brother Shane, 13. Diving on the dock is 10-year-

old Steven Miller. The other two youngsters are unidentified. Watching the proceedings is Chris Skillen, far right. All are from Toronto. For a story on the Harbour Day festivities, see page 3a.

Photo by Kevin Werner



# The ENTERPRISE-BULLETIN

HOME NEWSPAPER OF THE BLUE MOUNTAIN AREA

Wednesday, August 1, 1990

## Water In Collingwood Harbour Just Keeps Getting Better, RAP

Optimism continues to flow about the water quality from Collingwood's Harbour.

Gail Krantzberg, Collingwood's Remedial Action Plan (RAP) coordinator said water quality test results completed to the end of June 1990, have shown a decrease in phosphorus concentrations, a major contributor to algae growth in the harbor.

She said test stations, one near the harbor's beacon and the other located at the far east of the harbor, have documented average phosphorus values that are within required safety water quality guidelines as outlined by the provincial government.

A further benefit to the harbor's water is its visible improvement. The reason for this, Ms. Krantzberg said, is so far this summer "there has not

been a bacteria problem" in the harbor, which in previous years has resulted in cloudy water, and increased algae growth.

"To date we meet our water quality target," said Ms. Krantzberg during Friday morning's RAP meeting. "If you jump off a boat you would be okay. As you can see the harbor even looks better. There has been a visible improvement."

She cautioned RAP members, though, tests have yet to be conducted after a heavy rainstorm to see how bacteria and phosphorus concentrations would increase the harbor's water quality. For the summer and into October, she said they will "monitor the water" and continue to conduct tests.

But the positive results from the recent tests does pose the question when will Collingwood Harbour be removed from the Great Lakes list of toxic "hot spots".

Ms. Krantzberg said "if things continue to improve and we meet our target guidelines, we will write to the Ontario and Canadian governments to report that we have reached our objective of beneficial use goals in order to have Collingwood removed from the areas of concern." She said if this scenario does occur, Collingwood could be removed from the list "in about a year".

"The water is okay," she said. "And we hope the water will be okay during the summer. We don't foresee a bacteria problem this summer."

## RAP Prepares For Harbor Day

Collingwood's Remedial Action Plan (RAP) meeting discussed Collingwood's upcoming second Harbor Day to be held August 25, from noon to 5 p.m. by the town dock on the grain elevator pier.

Events and activities scheduled for the public include having a chance to meet Public Advisory Committee Members (PAC) and the RAP team, visit industry and community displays, learn about ways to improve water quality and local artists' works.

For more information the public can contact Gail Krantzberg, RAP coordinator at (416) 323-4956 or Josephine Ballio at (705) 444-2500.

## Signs Please

Gail Krantzberg, RAP coordinator said during the Friday RAP meeting she was pleased with the Collingwood Harbour RAP signs recently mounted by PAC on the road heading towards the Collingwood Terminals.

Ms. Krantzberg said since the signs were put up, she has had a number of phone calls from people asking to be placed on RAP's mailing list.

## Treatment Place Still Has Room

Don Green, the environmental services coordinator for the town of Collingwood explained to the RAP meeting the Sewage Treatment Plant's (STP) Capacity Study revealed the facility has 1.4 million gallons of spare capacity in reserve.

Mr. Green said, later 1-million gallons could be used for future industrial use, while 5,000 gallons could be earmarked for possible household useage.

"It will be up to the politicians to decide how they will allocate that million gallons," said Mr. Green.

He said his figures showed that between 55 and 60 per cent of the

rial and commercial businesses. The total flow of the STP is 3-million gallons.

Mr. Green also reported the Sewage Treatment Plant is below the one parts per million level of effluent being discarded. The STP is coming in at .5 parts per million.

Mr. Green said up-grading the STP could be done without having an environmental study. He said they "could do some things inside the plant to upgrade".

Mr. Green said it was found one town car wash contributing to increase phosphate concentrations.

"We asked the managers of the car wash in question to get rid of their

convinced him to use non-phosphate soap. They're better cleaners. So hopefully our numbers will go down."

# Collingwood Harbour Water Quality Sees Algae Reduction

By KEVIN WERNER  
of The Enterprise-Bulletin  
The quality of Collingwood Harbour's water is "getting better". This should translate into a reduction in algae growth in the future, said Gail Krantzberg, sediment specialist of the Great Lakes section of the Water Resources Branch of the ministry of the environment.

"There has been remarkable improvement to the water quality," said Ms. Krantzberg, who was revealing the 1989 Water Quality Study preliminary data to Collingwood's Remedial Action Plan (RAP) meeting.

Friday, at the Leisure Time Club. "I think this data shows there has been an excellent start."

Ms. Krantzberg showed the phosphorus concentration levels were fairly consistent from April to November, but were "elevated during the summer". The data showed that Collingwood's Sewage Treatment Plant (STP) and Oak Street canal were the sources for the phosphorus discharges into the harbor. Phosphorus is a nutrient which contributes to algae growth in the harbor.

"They (the STP) far exceeded anything else in output," she said as the red bars, representing the STP, dominated the charts. "It's fairly obvious. A picture is worth a thousand words."

As a percentage of total phosphorus loadings, 98 per cent came from the STP while 2 per cent was recorded from the Oak Street and the Hickory Street canals and Black Ash Creek.

"SWIMMABLE"  
Ms. Krantzberg reported Collingwood Harbour was of "swimmable quality".

"You could have swum in the harbor at any part of it during the summer," she said. "The data shows it was beautiful for the summer months."

Of the bacteria concentration that was found in the harbor, 73 per cent came from the STP, 17 per cent from Black Ash Creek, and five per cent both from Hickory and Oak Street canals.

Ms. Krantzberg suggested that a cause for the high STP outflows was because of an increase in loading. Don Green, environmental services manager for the Town of Collingwood, said this was not the case.

"During the period from June to August 1989, the loading was measured and it was less for the year," he said. The STP discharged 5.4 million imperial gallons a day during the study period.

"Another possibility that could have caused the high outflows from the STP was the weather pattern, which could have prevented a thorough flushing of the harbor," said Ms. Krantzberg.

But the positive results from the water quality data was tempered by the fact that the study did not take into consideration storm runoff.

**MAJOR RAINSTORMS**  
"There were no major rainstorms during the summer," she said. "This prevented us from getting a true measure on how the harbor reacts during a rainstorm. We can't answer definitively on the harbor's phosphorus levels. But we will continue our monitoring this year and hope for some rain."

Ms. Krantzberg also said the sediment in the drydock area of the harbor "is contaminated" but is of no concern to the harbor. "The sediment is not moving into the open water," she said. "And we have the studies to prove that."

Mr. Green said the STP numbers are exceptional for this plant. He said he did not think the STP "could go lower than it is" in reducing phosphorus levels.

"The STP is well below the numbers and that is good news," said Ms. Krantzberg. "But what we want to know, is that good enough for Collingwood Harbour?"

She said another reason for the second phosphorus output by the STP is because area industries have increased their phosphorus discharges.

The logic behind that, Mr. Green

Collingwood Harbour to the point where it is "safe enough to swim in" to "the water quality within the harbor should meet provincial bacteriological guidelines for body contact activities with the understanding that these guidelines may not be met for a brief period of time following storm events".

This statement goal met with the PAC's approval since as Larry Houghton, representing the Collingwood Yacht Club said, they "did not want to get into the problem whether (the water in the harbor) is safe or not". "And if you use a flag system, you automatically are promoting it."

"I don't think a lot of people swim in the harbor," said Mr. Green.

After the data was presented, the PAC re-emphasized their acceptance of the preliminary remedial options to be submitted to the RAP team.

There were no disagreements as to the options involving the STP. But Mr. Green said he had to make clear, an environmental study report on the STP will be commencing in the future to study the efficiency of the STP.

One option that came under fire was the exchange of harbor water with that of Georgian Bay. Wes Lammer, of the ministry of the environment for the central region of Ontario said "dilution is not the solution for the pollution".

"You are only spreading the effluence around."

**PROPOSED GOAL**  
Ed Houghton, manager of the Collingwood Public Utilities Commission and chairman of the Collingwood Harbour RAP meeting said he agreed with the proposed goal and insisted it stay in the remedial option plan.

But the question of what RAP's objective should be was made clear when Dale Rowe of the Simcoe County Health Unit asked Ms. Krantzberg if "we reduce the phosphorus and we meet the provincial guidelines, then we're on our way to being deleted, is that it?"

"At the rate we're going, that is the way we do it," she said.

The next RAP meeting is scheduled for April 20 at the Leisure Time Club.

## Integrating Education Priority For Collingwood Harbour 'RAP'

To get the message out to Collingwood residents about the improvement of the Collingwood Harbour's water quality, an education sub-committee was struck at the Collingwood Harbour Remedial Action Plan meeting (RAP), Friday morning.

"Whatever we endorse here, we had better integrate education into it," said Ben Bennett, community liaison officer of the Georgian Triangle Waste Management Master Plan, at the Leisure Time Club. "And it should be adequately funded."

Tom Green, facilitator for the RAP meeting, outlined a draft public education strategy to the Public Advisory Committee (PAC). "You people have

a lot more expertise in that area (education) than we do."

Mr. Bennett advised PAC that a "good notice board" would be a "very effective tool" to get the information out to the public.

Mr. Bennett also suggested t-shirts could be made up; signs (like the ones that were made up to inform people in the surrounding area about the waste management plan) can be constructed and a speakers' bureau could be established on which schools and groups could capitalize.

"These are a few good ways to get the word out to the public," he said.

Mr. Green said the purpose of public education was to give people

information "so they can be educated and environmentally trained."

"This education strategy should improve the harbor in one way by changing people's behavior so they can take care of the environment," said Mr. Green. "It is not as up to us to brainwash them into doing so."

Greta McCallister, representing the Senior League of Collingwood said RAP "should stress the improvement the Collingwood Harbour has undergone by the RAP process because a lot of people don't know what has happened. It's amazing what a little information can do for people."

**RAP NEWSLETTER**

Mr. Green solicited advice as to the kinds of information the RAP newsletter should contain in order to "inform the Collingwood residents what they should know about the Collingwood Harbour".

A few suggestions that were voiced included adding the members of the PAC, what the RAP process is all about, and update the public on the conditions of the fish in the harbor.

Jim Kilgour, a teacher from Collingwood Collegiate Institute recommended RAP should create a central area for reference material about the environment to be at the disposal of the public.

"We (RAP) don't want to become involved as a library," he said. "But area schools could be used in this instance. This type of program could change the attitudes of people."

"We should be strong in our approach to educating the public about the harbor," said Mr. Bennett. "It's a popular local tourist attraction. It should be funded properly. Do not 'Mickey Mouse' it."

Ms. McCallister said soliciting RAP and the Collingwood Harbour would not be the only way to

use Environmental Week, to be organized sometime in June, as an effort to get the message across to the people.

**EFFICIENT USE**

Ed Houghton, manager of the Collingwood Public Utilities Commission and chairman of the RAP meeting said efficient use of water such as using energy-efficient shower heads should also be publicized.

He requested that an education committee be formed and for its first meeting a "budget should be placed on its agenda".

Gail Krantzberg, sediment specialist of the Great Lakes section of the Water Resources Branch of the ministry of the environment and co-ordinator of the Collingwood Harbour RAP meeting accepted Mr. Houghton's and Mr. Bennett's suggestions saying this is a program that can happen right away.

Mr. Houghton and Ms. Krantzberg also agreed the RAP organization should work in conjunction with Collingwood's media to inform area residents of the work the RAP committee has done to clean up Collingwood Harbour.

"These are the type of strategies that can stop it (environmental ignorance) at its source," Ms. Krantzberg said.

## Fish Caught In Harbor Should Be 'Clean': Expert

The fish in Collingwood Harbour are "good and clean" said an official from the provincial ministry of natural resources.

"There is no question fish that are indigenous to the harbor - perch and small-mouth bass - are healthy," said Alex Smith, of the provincial ministry of natural resources, Midhurst. "The 14-inch yellow perch that was caught here (Collingwood Harbour in 1984) that had mercury in it, came from another place. At no time have we found mercury, or any other type of toxic substance in fish that have lived here."

Gail Krantzberg, sediment specialist of the Great Lakes section of the Water Resources Branch of the ministry of the environment and co-ordinator of the Collingwood Harbour RAP (Remedial Action Plan) meeting, said the fish

that was found in the yellow perch "was a small amount just above provincial guidelines".

"Every sport fish in the water is fine," she said at the Friday morning RAP meeting at the Leisure Time Club. "We have not been able to catch another fish of that size and check to see if they would exhibit the same mercury count."

Ms. Krantzberg said if anybody does manage to land a fish of that length, "put it in the freezer and call the Ontario ministry of the environment".

She said if the person wants to eat the fish, she requests the person place a piece of muscle off the fish, place it in the freezer and call the ministry so it can be analyzed.

"And if you do," she said, "you will receive a free Collingwood Harbour RAP (Remedial Action Plan) meeting."

said, was because Collingwood's bylaws are "tougher than the province's MISA (Municipal-Industrial Strategy for Abatement, which controls an industry's discharges) guidelines".

The new data sparked a debate among the Public Advisory Committee (PAC) as to how reflective their "use goals" for the harbor should be in light of the buoyant water quality results.

**WATER QUALITY**

The PAC refined one water quality objective from attempting to get

Enterprise Bulletin Feb. 14, 1990

## Water Quality Better, Says MOE Official

Testing of the waters in and around Collingwood this summer has shown a marked improvement in quality over previous years.

Gail Krantzberg, co-ordinator of the Collingwood Harbour Remedial Action Plan (RAP), said testing started this year in April and will continue until November. Samples have been taken from stations inside and outside Collingwood Harbour, Black Ash Creek, Oak Street Canal, Hickory Street Canal and the sewage treatment plant outfall, said Ms.

Krantzberg. The collections are made by sampler Ches Pittman of Collingwood.

From August to October, the parks and recreation department is also helping to sample during storm conditions that may stir up the water, she said. Nutrient and bacteria levels, as well as sediments, have been analyzed during the summer months.

### MUCH BETTER

"The harbor is really looking much, much better than it has in past years. The nutrient levels are down to

half of what they were two years ago," said Ms. Krantzberg.

Ms. Krantzberg explained that too much nutrient causes excessive algae and vegetation growth. Sediment samples are currently being processed and analyzed.

The 1988 guide to eating Ontario sport fish has imposed no consumption advisory on walleye or white sucker in Collingwood Harbour, said Ms. Krantzberg. There is a single advisory that yellow perch greater than 14 inches should not be consumed for more than 10 meals per week, based on one week's consumption, or more than a half-pound per

week, based on long-term consumption.

"This restriction was based on mercury, but is not due to the harbor environment," she said.

The next Public Advisory Committee meeting for the Remedial Action Plan will be held at the Collingwood Leisure Time Club, September 22. The public is welcome to sit in on this meeting, however, anyone who wishes to speak at the meeting must make a formal submission in advance by calling Ms. Krantzberg at (416) 323-4994. A public meeting is expected to be held early next year.

E.B. Aug 26 / 89



## R.A.P. Rap

By LEONE HALL

Why on earth was the Collingwood Harbour made an Area of Concern (AOC)?

It is not polluted in the sense that toxic contaminants are a concern, but it does have a problem.

The official reason for concern is "nuisance algal growth", which means too many aquatic plants.

Studies have shown that the build-up of nutrients in the harbor waters caused the problem. The Collingwood Harbour Remedial Action Plan (RAP) was developed to deal with the problem.

The RAP is one of 42 such plans being put together in communities around the Great Lakes.

As far back as 1909, Canada and the United States recognized the need to prevent and resolve problems along their common border by signing the Boundary Waters Treaty.

By 1960, excessive inputs of phosphorus and other nutrients to the Great Lakes resulted in accelerated growth of algae and other undesirable changes in water quality.

Nutrient problems in Lake Erie at the time were so bad that parts of the lake were considered virtually dead.

The Great Lakes Water Quality Agreement was signed by both governments in 1972 and provided the focus for a co-ordinated clean-up effort.

In 1978, and again in 1987, the agreement was revised and expanded to recognize the need to understand and control contaminants discharged into the Great Lakes.

One specific approach to cleaning up the Great Lakes is the development of Remedial Action Plans for Areas of Concern. These are regions where there is an "impairment of beneficial uses".

This term applies broadly to a range of uses and activities such as municipal water supplies, sewage treatment plant operations, recreation, and maintenance of healthy aquatic life.

The nuisance algal growth in the Collingwood Harbour has restricted full use and enjoyment of the harbor -- the algae snags propellers and leaves a scum on the water's edge. The harbor plan requires substantial public involvement. We all use it, one way or another, so we should all have some input to its future.

The first phase of public involvement began with the provision of information to the community about the environmental conditions of the harbor.

At Harbour Day, in 1988, there

were displays and a tour of the harbor. Hundreds of local residents and visitors attended.

A public advisory committee (PAC) was then put together to guide the plan.

The PAC membership represents a broad range of community interests. It is chaired by Ed Houghton, operations manager of the Collingwood Public Utilities Commission. Doug Garbutt, general manager of Nacan Products and Collingwood Councillor, is vice-chairman. There are committee members from harbor user groups, technical advisers and government, as well as citizen representatives.

In consultation with the provincial and federal governments, the PAC came up with a list of desired uses and goals for the harbor. These were reviewed at a public meeting held in January of last year. They include:

### GOALS

1. The water quality of harbor should be such that the flow into Nottawasaga Bay should not adversely change the bay or affect the town's drinking water.
2. The harbor water should be aesthetically pleasing so it can be used for passive recreation.
3. Use of the harbor should ensure that fish and wildlife levels within the harbor area are sustained.
4. Designated swimming areas should not be a goal within the harbor, but water quality should move towards the goal of being safe enough to swim in.

### USES

Commercial/Industrial Uses:

1. Continued disposal of sewage treatment plant effluent.
2. Maintain existing shipping, berthing and grain handling.
3. Charters.
4. Sightseeing.

Recreational:

1. Boating.
2. Sport fishing and ice fishing.
3. Nature observation.
4. Public marina (full service).

There are all kinds of things we can do to improve the quality of our harbor water, including changing the way we view the harbor and the actions we take which directly affect it.

In future articles, we will look at some of them in detail. Also, there will be an update on the progress of the plan.

For more information about the RAP, call Gail Krantzberg at (416) 323-4956 collect.

Leone Hall is co-chairman of the Public Awareness Subcommittee of the Public Advisory Committee of the Remedial Action Plan.



# COLLINGWOOD HARBOR

PUBLIC ADVISORY COMMITTEE



## LET'S 'PYRAMID'

# R.A.P. Rap

By LEONE HALL

Over the past two years the group of citizens interested in our Collingwood Harbor and the Remedial Action Plan (RAP) to keep it healthy feels you will all have become well aware of this term "RAP".

The founding and growth of this group was recently reviewed in The Enterprise-Bulletin so we will not go into detail on who we are nor why we are working towards our common goal of a clean harbor and people-friendly environment.

This RAP group feels strongly that one important and timely service we can do to serve this community is to share knowledge -- garnered from hints received, meetings attended, many hours of educational reading we are doing, and knowledge gained from expertise in our respective vocations. We must also get this information circulating as quickly as possible to the widest audience possible.

### HEALTHY HARBOR

Your RAP group has formed an Awareness Committee and the writer has agreed to pass along to you any information we gather or that you may (we hope) route to us which will contribute to a healthy harbour, community, environment and ecosystem.

We will be taking a "grab-bag approach" in this column. The information we have for you runs the gamut from ways to cut down daily water use (thus decreasing flow and expense of treatment at Collingwood's filtration plant) to how to make your personal property (garden, farm, section of waterway) nourished, free from chemicals and erosion of nutrients and of land itself.

The aim is to make each of us aware of the small and large ways in which we all contribute our share (knowingly or unknowingly) to environment-bashing.

Do cut out these articles and use them as the basis for discussions at home and as input within the offices, clubs and organizations that touch your lives. Stick them front and centre on that essential filing cabinet we all use in our homes ... the refrigerator door: to remind you and your family to act on new information wherever possible.

It is hard to break old habits. To discuss the information with all and sundry who enter your home or office. Please share with this column when such dialogue generates new approaches to deal with the various segments making up environmental concerns. To eventually pass the article along to your clubs and groups for inclusion in their discussion groups and newsletters.

Our aim is to "Pyramid" all this pertinent information we gather together for you. "Pyramiding" is a very effective way to recruit kindred spirits with common beliefs. Illegal in Ontario when money or product is involved -- we can use the pyramid process to efficiently, effectively and cheaply pass knowledge along on ways and means for one person to make a difference in slowing up the degenerative processes already at work in nature.

To pyramid ... Clip our articles and discuss with family and friends. Ask each person to discuss with their families and friends. Asking each of them, in turn, to discuss ... ad infinitum. It works! Let's all try pyramiding our vital information!

For more information about the R.A.P., call Gail Krantzberg collect at (416) 323-4956.

**EDITOR'S NOTE:** Leone Hall is co-chairman of the Public Awareness Subcommittee of the Public Advisory Committee of the Remedial Action Plan.

## COLLINGWOOD HARBOR

PUBLIC ADVISORY COMMITTEE



### RAP Rap

# Walk Your Property Before Snow Arrives

#### PART ONE

By LEONE HALL

This is that wonderful time of the year when we usually have great weather to get our house and property in order to withstand the stresses and strains of winter.

This year most of us are particularly aware of environmental concerns and will be looking for ways to practice good land stewardship.

After all, we are only entrusted with "the use of" this land during our tenancy on this earth so it is our obligation to leave it in as good as - or better - condition than when we took over.

Now is a good time to walk our own land and look objectively at our town property, home gardens, cottages, chalet grounds; at our farms, places of business and industrial properties to put into practice this good land stewardship that is our obligation to future generations. Nature "does rejuvenate" herself, given a fair chance to do so, and since we have so grossly misused our tenancy these past four or five decades we owe nature a helping hand to speed up the process of rejuvenation and recovery from our environment bashing practices.

What to look for as you walk about your property?

#### SOIL EROSION

Think about possible soil erosion. Look where you might put man-made barriers (fences, rocks, berms, bales of hay, etc.) or natural barriers (plantings of shrubs, trees) to control winter winds and loss of top soil; erosion of stream banks or undercutting the root soil of shrubs and trees. Especially vulnerable are new construction sites. This is the perfect time of year to plant most trees and shrubs.

Perhaps the above-mentioned tactics will be helpful but, better still, make specific plans to give priority to your basic landscaping plans because trees and shrubs will not only control soil erosion but will permanently enhance the property value and contribute towards a healthy, visually pleasing environment. This kind of ground cover is "natural" - it holds the soil on your land as long as possible and prevents it from washing into our sewer system or being flushed directly into the harbor.

Wildlife will soon gravitate to use it, bringing their benefits with them and trees consume the "greenhouse" gases which contribute to the global warming.

#### FINAL COATING

Consider what late fall fertilizing has done to your boulevards, lawns, gardens, orchards, professional golf courses and commercial parkway and scenic areas. Is that final coating of fertilizer really necessary? Would Nature not do a commendable job on her own? Why not try it this year and see if the grass on the lawn at your factory, office, home - yes, even certain areas of that golf course - does not grow lush and green come next April. Consider the use of compost as a healthy alternative to chemical fertilizers.

Ask contractors. Make a note to spend some time this winter asking direct questions of your landscape and weed control contractors and of your suppliers to make sure they are using the environmentally friendly products already on the market.

Should you decide to continue using fertilizers and pesticides and have assured yourself they are technically "friendly" - consider cutting down on the quantity used at each application or the number of applications made on your property.

A problem with fertilizers and pesticides is they leach into the ground (admittedly doing their job) but end up being spread around through wind, rain and snow (remember the Spring runoff that ends up on or in our bays and lakes); get washed into our sewer system and you pay to process them through the sewage treatment plant; or streams carry their residue directly into the Collingwood Harbor which could create problems.

Next R.A.P. Rap - Part Two - "Make Your Property A Haven".

EDITOR'S NOTE: Leone Hall is a member of the Collingwood Harbour Public Awareness Committee. For further information, telephone co-ordinator, Gail Krantzberg, collect, at (416) 323-4956.



## R.A.P. Rap

# Our Town's Water Pollution Control Plant

By LEONE HALL  
PART ONE

Collingwood's Water Pollution Control Plant (WPCP) is located at the north end of Birch Street adjacent to the shipyard property.

A micro-explanation of what goes on at this plant is:

Sewage is screened, settled, and organic matter is digested by micro-organisms. The effluent is then chlorinated and finally phosphorus is removed. Sludge is treated and disposed of. Clear water is pumped out into Collingwood's Harbor to eventually be circulated out to Nottawasaga Bay and then west to Georgian Bay by wind and currents.

Our WPCP is only designed to treat nutrients and bacteria, hence toxic substances that enter the plant find their way to the sludge, or in the water to the harbor.

Collingwood's requirements for clean water starts the cycle all over again as our pumping station draws in approximately four million gallons per day. Hume Street water tower is 25 feet deep, holds 500,000 gallons of water and is used for water pressure as well as a back-up source of water.

A more detailed look discloses that sewers feed into the WPCP from every corner of Collingwood town limits via a 36-inch diameter influent sewer. Inside it passes through a manually raked bar screen before entering the raw sewage pumping station. Trash from the bar screen is disposed of at a landfill site.

It is to our advantage to keep plastics, leaves and other trash cleared away from sewer grates that are on or near our properties. This is especially important after a heavy rainfall or windstorm.

Pumps move a maximum total capacity of three million Imperial gallons per day. Four million gallons is their average daily flow. Raw sewage from the pump station inlet well is lifted through a 24 inch diameter pipe to the inlet works. A flow recorder measures plant inflows and paces the rate of phosphorus removing chemical.

### COMPRESSED AIR

The inlet works consist of two aerated grit removal tanks and three barminutors (grinders). Raw sewage enters the two grit tanks which are aerated by compressed air, fed from two air blowers. This keeps the organic matter in suspension but allows the heavier inorganic grit to settle in the bottom hoppers of the tanks. The grit is removed periodically from the hoppers by an overhead bucket and disposed of at a landfill site. From the grit tanks, the sewage passes through the barminutors which shred any rags, pieces of plastic or other material. The shredded matter is returned to the wastewater for removal later in the process.

Three rectangular clarifiers, equipped with longitudinal and cross sludge collectors, remove approximately 30 per cent of the organic

## COLLINGWOOD HARBOR

PUBLIC ADVISORY COMMITTEE



matter entering the plant. The "sludge" is scraped to hoppers in the tank bottoms, from where it is removed by the primary sludge pumps to the sludge digesters. Any floating matter (scum) is removed from the tanks by manually rotated scum troughs. The scum is pumped to sludge digesters by separate pumps. Effluent from the primary clarifiers is passed to aeration tanks for secondary treatment.

This secondary treatment is known as the conventional activated sludge process - a biological process in which a massive culture of micro-organisms is maintained to consume the incoming waste as food. Treatment of waste is determined by measuring the BOD (Biochemical Oxygen Demand) of the waste. The mixture of the incoming waste and the micro-organisms is referred to as the "mixed liquor suspended solids".

In order to carry out biochemical oxidation, the micro organisms require oxygen and this is provided by surface aerators which entrain air into the mixed liquor.

Effluent from the primary clarifiers flows to the aeration tanks which consist of two cells, each with three compartments. Each of the six compartments is equipped with a 40 HP aerator. The activated sludge (micro organisms) which settle out in the final clarifier, is continuously returned to the inlet end of the aeration tanks to begin feeding through once again. A number of different modifications of the activated sludge process can be selected depending on plant requirements.

### FINAL CLARIFIERS

The mixed liquor from the aeration tanks flows to two secondary or final clarifiers. The activated sludge settles out of suspension to the bottoms of the clarifiers where it is continuously scraped by collectors into hoppers in the bottom of the tanks. The sludge is removed from the clarifier hoppers by way of eight telescopic valves in each tank. The valves can be adjusted to control the quantity of sludge to be withdrawn. The sludge which is continuously removed from the tanks by hydrostatic pressure is pumped by two Archimedian type

screw pumps back to the aeration tanks. The much purified secondary effluent from the final clarifiers passes over weirs and into the chlorination chamber.

The secondary effluent from the final clarifiers flows continuously through a chlorine contact chamber where it is disinfected with chlorine solution as it passes through a chamber, before flowing over the outlet weir and into the outfall sewer to the harbor. The rate of flow of final effluent is measured and recorded as it passes over the outlet weir. The measured rate of flow is used to determine the quantity of chlorine solution to be added to the secondary effluent.

Collingwood's WPCP effectively turns raw sewage into acceptable effluent.

You can become knowledgeable regarding products used regularly about your person, household, garden, vehicles, and places of business and recreation - use environmentally friendly products and only in quantity enough to do the job properly.

Think about it before you:

- hose your car cleaning, waxing and polishing chemicals into the street (and hence the sewer);
- wash your vehicle too often;
- use a handful of hair shampoo instead of a "quantity the size of a dime" as recommended on the product container;

• load the lawn or garden with pesticides and chemical fertilizers in quantities more than needed to adequately do the job.

We could continue on with comments such as those mentioned above but there is really only one thing to remember - if it goes down a drain in your sink, your toilet or your street it ends up at the WPCP and they don't need any more!

**EDITOR'S NOTE:** Leone Hall is a member of the Collingwood Harbour Remedial Action Plan (R.A.P.) awareness committee. For further information, telephone R.A.P. co-ordinator Gail Krantzberg, collect, at (416) 323-4956.

# COLLINGWOOD HARBOR

PUBLIC ADVISORY COMMITTEE



By LEONE HALL

This R.A.P. rap (Remedial Action Plan) is about quality of water.

If a chemical is used to kill a pest in your garden there has to be something deadly about it. Do you agree with that?

If a chemical is used to green up your grass, or make it grow faster or thicker -- that's got to be a higher dose than Nature would bring, even if it is the environmentally friendly version.

Do you agree with that?

Birds and small animals are Nature's own pest controllers. Give them a natural habitat on your property and be well repaid -- they will eat all those grubby things chewing away at the roots of your garden and the leaves of your trees -- worms will aerate your lawns.

Our children learn a lot about environmental strategies at school. This Winter make it a family project to create an environment-safe haven of your land.

Exploit plants that "work together"

to repel insects and use this act of nature to your advantage, that is plant onions and beets side by side. Use marigolds to keep unwanted insects away. Garlic protects roses. A study of such mating plants during the Winter could set up your future garden planning in a whole new direction - and don't forget - even a small garden will benefit if rows are not all running in the same direction thus forming little corridors for erosion that allow soil with its natural nutrients and precious water to run off. Rotating vegetables in your garden each year will discourage infection and the need for pesticides.

## WETLANDS

If you have any area even remotely resembling a marshy wetlands on your property do preserve it and its inhabitants. For so many years we have been prone to fill in and "clean up" these areas where bullrushes grow and frogs croak in the evening. In our ignorance we considered them wastelands. Now we know better.

# Making Your Property Environment-Safe Haven

Now we know these areas are essential to the survival of the species - humans included. Now we face our picture windows to view such areas so we can enjoy the abundance of plants and teeming life.

Streams through your property should challenge you to provide an oasis of clean water and friendly habitat to encourage fish to your specific area wherever possible. Work with your neighbor to clean up banks and the streams themselves of garbage and litter; to plant ground cover and shrubs which will provide erosion control, wildlife benefits, windbreaks and a picturesque environment.

As you walk about and view your property from an environmental standpoint think of ways and means to enhance and preserve it. Make two plans - a short term one - of things you can do before Winter; the second - a long term plan which will give you the winter months to address your own specific areas of concern.

Collingwood Library has an accessible environmental section, including many government documents. It will be a tremendous help to you in organizing and prioritizing your concerns, thoughts and plans of action.

## BASIC INFORMATION

In addition to a wealth of information there, you will be able to get addresses of who to contact and basic information on how to go about qualifying and applying for government grants that may help you to reach your planned goals.

Collingwood-area residents are fortunate to live in an area where offices of federal and Ontario Ministries abound -- Natural Resources, Forestry, Environment, Soil Conservation, Agriculture.

In addition there are "authorities", heritage societies and gr. too

numerous to list that have done a lot of research on specific subjects and can answer questions or suggest available grants, loans or subsidies for which you may qualify.

Spend this Winter in your own interests - to rejuvenate the health and continued well being of your own particular little bailiwick. Talk over your plans with friends and co-workers, and especially with your neighbors -- perhaps there is something you can do together which will make an even bigger impact on the environment.

The writer can be reached by addressing a letter to this column at The Enterprise-Bulletin. Let us know how you make out and next Spring we will publish your success stories. Good Luck.

**EDITOR'S NOTE:** Leone Hall is a member of the Remedial Action Plan Public Advisory Committee. For further information, telephone RAP co-ordinator Gail Krantzberg, collect, at (416) 323-4956.

R.A.P. Rap

# Ice Fishing And A Clean Harbor

By LEONE HALL

Ice fishing - a great family sport! A stroll down to Collingwood's Harbour on a bright, sunny day to view the colorful "fish huts" attests to its popularity.

This is not a winter sport taken up by droves of people as with snowmobiling, downhill skiing, cross-country skiing or winter walking and hiking. This sport is reserved for the family or the person who wants to punch a hole in the ice, protect the body from the elements with a shelter of some kind, jig that line, enjoy solitude and the quiet companionship of kindred spirits.

We are fortunate in Collingwood in that we do not have to register our ice huts, as happened on Lake Simcoe when the amount of garbage left on the ice come spring, and indeed throughout the winter months also, made a registration program necessary so the "bad guys" could be identified. Conservation Officers of the Ministry of Natural Resources are empowered to lay charges for offences such as leaving garbage on the ice or allowing garbage or building materials to float around the harbour or into the Bay.

The Town of Collingwood requests only that ice hut owners



prominently display their name and telephone number on all four sides of their huts.

To address the garbage problem - containers with tight lids (to discourage sea gulls and the wind from blowing into the water) have been placed at spots convenient for ice fishermen to dispose of their garbage.

Words of wisdom from the Ministry of Natural Resources: Those not familiar with the area should use caution before venturing out on the ice. Ask local people about ice conditions, about the best areas for fishing and to identify good spots for placing ice huts.

When placing a hut on the ice it is recommended that the hut be jacked up so it does not become frozen into the ice; then bank snow around it to keep it snug and warm. If this has not already been done watch for a thaw and when there is a skim of water on the ice, jack the hut up at that time. If not, when it is time to remove the hut from the ice you may find yourself

leaving part of the structure behind because it is frozen down into the ice.

Remember: every time you leave, take all garbage off the ice with you. Mark all outside ice holes with branches when you leave at the end of the day. When the ice hut is taken to shore, mark with branches or old Christmas trees the holes you made inside the ice hut.

The Ministry of Natural Resources advertises the times when ice huts must be removed from the harbor and from the shore on to private property.

This year that date will be March 31st if Mother Nature does not exercise her prerogative sooner!

When using the harbor -- please remember -- as anglers and as citizens interested in future fishing and a sustainable ecosystem - we must all work together to maintain and to improve the quality of water in our harbour specifically and the Great Lakes in general.

Typical of Northern Ontario, it is indeed a beautiful sight to see the sun setting behind a group of brightly colored ice huts with spirals of smoke curling from their chimneys.

Enjoy!

**EDITOR'S NOTE:** Leone Hall is a member of the Collingwood Harbour Remedial Action Plan (RAP) Awareness Committee.

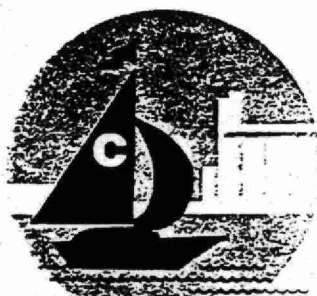


## APPENDIX II

# COMMON ACRONYMS

### ADI

*Acceptable Daily Intake:* The dose of a substance that is anticipated to be of negligible risk to humans when taken daily. It is not assumed that this dose guarantees absolute safety. The determination of the ADI is often based on the application of laboratory animal toxicity data concerning chronic (long-term) doses to the environmental doses to which humans are exposed.



**EXPLORATIONS**  
DISCOVERY MANUAL

**ADI**

*Acceptable Daily Intake:* The dose of a substance that is anticipated to be of negligible risk to humans when taken daily. It is not assumed that this dose guarantees absolute safety. The determination of the ADI is often based on the application of laboratory animal toxicity data concerning chronic (long-term) doses to the environmental doses to which humans are exposed.

**AOC**

*Area of Concern:* Geographic area that fails to meet the General or Specific Objectives of the Canada - U.S. Great Lakes Water Quality Agreement where such failure has caused, or is likely to cause, impairment of beneficial use, or of the area's ability to support aquatic life.

**BaP**

*Benzo - a - Pyrene*

**BAT**

*Best Available Technology/Treatment*

**BATEA**

*Best Available Technology/Treatment Economically Achievable*

**BCF**

*Bioconcentration Factor:* The ratio of the concentration of a particular substance in an organism to the concentration in water, food or sediment.

**BCT**

*Best Conventional Technology*

**BEJ**

*Best Engineering Judgement*

**BHC**

*Benzenehexachloride or hexachlorocyclohexane:* There are three isomers; alpha, beta, and gamma. Gamma - BHC is the insecticide lindane, and is highly toxic.

**BOD**

*Biochemical Oxygen Demand:* The amount of dissolved oxygen consumed during the decomposition of organic nutrients in water during a controlled period and temperature.

**CBs**

*Chlorobenenes:* Used for solvents, pesticide intermediates, and heat transfer mediums.

**COA**

*Canada - Ontario Agreement Respecting Great Lakes Water Quality.*

**COD**

*Chemical Oxygen Demand:* The amount of oxygen required to oxidize completely by chemical reagents the oxidizable compounds in an environmental sample.

**CofA**

*Certificate of Approval (Ontario Ministry of the Environment)*

**CPs**

*Chlorophenols:* Used for fungicides, algicides, herbicides, and wood preservatives.

**CSO**

*Combined Sewer Overflow:* A municipal sewer for the collection and transmission of surface and ground waters and sewage; combined storm and sanitary sewer systems.

**DCB**

*Dichlorobenzene:* Used for fumigants, insecticides, solvents, heat transfer, metal polish, and a degreaser.

**DDD**

*Dichlorodiphenyldichloroethane:* A natural breakdown of product DDT.

**DDE**

*Dichlorodiphenyldichloroethylene:* A natural breakdown of product DDT.

**DDT**

*Dichlorodiphenyltrichloroethane:* A widely used, very persistent chlorinated pesticide. Most uses of DDT were phased out by 1969, but DDT persists in sediments and biota. It is used as an insecticide for tobacco and cotton industries, and as a pesticide for the tussock moth.

**DFO**

*Department of Fisheries and Oceans (Canada)*

# COLLINGWOOD HARBOUR

## REMEDIATION ACTION PLAN





**DOA**

*Department of Agriculture (Canada)*

**DOE/EC**

*Department of Environment/ Environment Canada*

**DWSP**

*Drinking Water Surveillance Plan*

**EC-50**

Effective concentration of a substance producing a defined response in 50% of a test population. The higher the EC-50 the less toxic the substance is because it requires more material to elicit the desired response.

**ED-50**

Dose of material estimated to be effective in producing sublethal response in 50% of organisms tested - rarely applicable to aquatic organisms.

**EPA/USEPA**

*United States Environmental Protection Agency*

**GLISP**

*Great Lakes International Surveillance Plan:* It provides monitoring and surveillance guidance to Canadian and U.S. agencies responsible for implementing the provisions of the GLWQA that include general surveillance and research needs as well as monitoring for results of remedial actions.

**GLWQA**

*Great Lakes Water Quality Agreement*

**HCB**

*Hexachlorobenzene (perchlorobenze):* Used as a fungicide for seeds and wood preservative.

**HCBD**

*Hexachlorobutadiene:* Used in heat transfer liquids and transformer/hydraulic fluids.

**HCE**

*Hexachloroethane (perchloroethane, carbon trichloride, carbon hexachloride):* used in solvents, smoke devices, and is a fermentation retarding agent.

**HCCH**

*Hexachlorocyclohexane:* Used as an insecticide component.

**HCP**

*Hexachlorophenol*

**IJC**

*International Joint Commission:* A binational organization established in 1909 by the Boundary Waters Treaty. Through the IJC, Canada and the United States cooperatively resolve problems along their common border, including water and air pollution, lake levels, power generation and other issues of mutual concern.

**LC 50**

Lethal concentration (by volume) of a toxicant or effluent in water which is lethal to 50% of the test organisms over a specified time period. The higher the LC50 the less toxic it is because it takes more toxicant to elicit the same response.

**LD 50**

Lethal dose which (per unit body weight) is lethal to 50% of the test organisms over a specified time period. The higher the LC 50 the less toxic it is because it takes more toxicant to elicit the same response.

**LOEC**

*Lowest Observed Effect Concentration:* Lowest concentration of substance having an adverse effect.

**MATC**

*Maximum Acceptable Toxicant Concentration:* Toxic threshold concentration bounded by NOEC and LOEC.

**MDNR**

*Michigan Department of Natural Resources*

**MISA**

*Municipal - Industrial Strategy for Abatement:* The principal goal of this program is the virtual elimination of toxic discharge from point sources to surface waters in Ontario.

**NOAA**

*National Oceanic and Atmospheric Administration*

**NOAEL**

*No Observable Adverse Effects Level*

# COLLINGWOOD HARBOUR

## REMEDIAL ACTION PLAN





**NOEC**

*No Observable Effect Concentration:* The highest concentration of substance that has no significant adverse effect.

**NPDES**

*National Pollutant Discharge Elimination System:* a permit system limiting municipal and industrial discharges, administered by EPA and the states.

**NTU**

*Nephelometric Turbidity Unit*

*NYDEC* New York Department of Environmental Conservation

**OCs**

*Organochlorine Pesticides*

**OCS**

*Octachlorostyrene (o-chlorostyrene)*

**OMNR**

*Ontario Ministry of Natural Resources*

**OMOE**

*Ontario Ministry of the Environment / Environment Ontario*

**OTCW**

*Once Through Cooling Water*

**PAH**

*Polynuclear Aromatic Hydrocarbons* also known as *Polycyclic Aromatic Hydrocarbons* or *Polyaromatic Hydrocarbons:* Aromatic Hydrocarbons composed of at least 2 fused benzene rings, many of which are potential or suspected carcinogens. Compounds are derived from petroleum and coal tar, and natural processes. The Furan group (PCDFs) are similar to aromatic compounds.

**PBB**

*Polybrominated biphenyl:* used primarily as a fire retardant.

**PCB**

*Polychlorinated Biphenyl:* (Aroclors) a class of persistent organic chemicals with a potential to bioaccumulate through the food chain, cause reproductive failure, a suspected carcinogens; a family of chemically inert compounds, having the properties of low flammability and volatility and

high electrical insulation quality. Past applications include use as hydraulic fluids, heat exchange and dielectric fluids; plasticizers for plastics. They were banned in 1980, except for continued use in existing electrical equipment. As well as entering the Great Lakes from leaks and spills, they can be released by incineration, and travel through the atmosphere.

Number designation of PCB congener indicates % (percent) of chlorine - the higher the chlorine content, the more persistent.

**PCC**

*Polychlorocamphenes*

**PCDD**

*Polychlorinated dibenzo-p-dioxin*

**PCDF**

*Polychlorinated dibenzofurans*

**PCP**

*Pentachlorophenol:* Used in wood preservatives, fungicides, algicide, herbicides.

**pH**

*A measure of acidity or alkalinity of water on a scale from 0 to 14: 7 is neutral; low numbers indicate acidic conditions, high numbers indicate alkaline conditions.*

**POTW**

*Publicly Owned Treatment Works*

**PTS**

*Persistent Toxic Substance:* Can be defined as any toxic substance with a half-life in water of greater than eight weeks.

**RAP**

*Remedial Action Plan:* This is a plan to be developed with citizen involvement to restore and protect water quality at each of the 43 Areas of Concern in the Great Lakes Basin. The RAP will identify impaired uses, sources of contaminants, desired use goals, target cleanup levels, specify remedial options, schedules for implementation, resource commitments by state, provincial and the federal governments, municipalities and industries, and develop monitoring requirements to assess the effectiveness of the remedial actions implemented.

# COLLINGWOOD HARBOUR

## REMEDIAL ACTION PLAN



**SPDES**

*State Pollutant Discharge Elimination System:*  
state - administered permit limiting municipal and industrial dischargers.

**STP**

*Sewage Treatment Plant*

**TCB**

*Trichlorobenzene:* Used as a solvent in chemical manufacturing, synthetic transformer oils, lubricants, and insecticides.

**TCDD**

*2,3,7,8 - Tetrachlorodibenzo-p-dioxins:* The most common form of more than 70 members of the dioxin family. It is a carcinogen, teratogen and a mutagen.

**TCDF**

*2,3,7,8 - Tetrachlorodibenzofurans:* Used in insecticides. Dibenzofuran is also known as diphenylene oxide, derived from coal tar.

**TDE**

*Tetrachlorodiphenylethane*

**TeCB**

*Tetrachlorobenzene*

**TOTAL DDT**

*Sum of DDT isomers*

**UGLCCS**

*Upper Great Lakes Connecting Channels Study*

**U.S. EPA**

*United States Environmental Protection Agency*

**WHO**

*World Health Organization*

**WPCP**

*Water Pollution Control Plant*

**WTP**

*Water Treatment Plant (for drinking water)*

**WWTP**

*Waste Water Treatment Plant*

# COLLINGWOOD HARBOUR

## REMEDIAL ACTION PLAN



**E**

# A GLOSSARY OF COMMON TERMS



**EXPLORATIONS**  
DISCOVERY MANUAL

**ABSORPTION**

Penetration of one substance into the body of another.

**ACCLIMATION**

Physiological and behavioural adjustments of an organism in response to a change in environment. See also Adaptation.

**ACCLIMATIZATION**

Accimation of a particular species over several generations in response to marked environmental changes.

**ACCUMULATION**

Storage of a chemical in tissue. May also apply to the storage and concentration of a chemical in aquatic sediments to levels above those that are present in the water column.

**ACUTE**

Involving a brief exposure to a stimulus. In bioassay tests, a duration of 96 hours is typically considered acute.

**ACUTE TOXICITY**

Mortality or other toxic effects that are produced within a short period of time, usually 24 to 96 hours.

**ADAPTATION**

Change in the structure, forms or habits of an organism to better fit changed or existing environmental conditions. See also Acclimation.

**ADIPOSE**

Of, like, or containing animal fat: Fat in the connective tissue of an animal's body.

**ADSORPTION**

The taking up of one substance at the surface of another.

**AEROBIC**

The condition associated with the presence of free oxygen in the environment.

**ALGA (E)**

Simple one-celled or many-celled micro-organisms, usually free-floating, capable of carrying on photosynthesis in aquatic ecosystems; a form of aquatic plant.

**ALGICIDE**

A specific chemical highly toxic to algae. Algicides are often applied to water to control nuisance algal blooms and may contain harmful contaminants.

**ALKALINITY**

A measurement of acid neutralization or buffering capability of a solution (see pH).

**ALKYLATED LEAD**

A contaminant in the environment, resulting mainly from burning leaded gasoline, but also found in some industrial emissions. Lead concentrates in the skeleton are causing cumulative poisoning, especially in young children.

**AMBIENT**

An encompassing atmosphere.

**AMBIENT STANDARDS**

The concentration of a toxic substance in the water, which based on available data, will not result in significant risks of adverse effects to biota or human health.

**AMBIENT WATER**

The water column or surface water (lake, river, etc.) as opposed to groundwaters or sediment pore water.

**AMPULE**

A sealed glass container of a known concentration or volume of a substance.

**ANADROMOUS**

Species which migrate from salt water to freshwater to breed.

**ANAEROBE**

An organism for whose life processes a complete or nearly complete absence of oxygen is essential.

**ANOXIA**

The absence of oxygen. In aquatic ecosystems this refers to the absence of dissolved oxygen in water.

# COLLINGWOOD HARBOUR

## REMEDIAL ACTION PLAN



### **ANTAGONISM**

Reduction of the effect of one substance because of the introduction or presence of another substance; e.g. one substance may hinder, or counteract, the toxic influence of another. See also Synergism.

### **ANTHROPOGENIC**

Human related activities.

### **APPLICATION FACTOR**

A factor applied to a short-term or acute toxicity test to estimate a concentration of a contaminant or waste stream that would be safe in a receiving water.

### **AQUATIC**

Living in water.

### **ASSIMILATION**

The absorption, transfer and incorporation of substances (e.g. nutrients by an organism or ecosystem).

### **ASSIMILATIVE CAPACITY**

The ability of a waterbody to transform and/or incorporate substances (e.g. nutrients) by the ecosystem, such that the water quality does not degrade below a predetermined level.

### **ATMOSPHERIC DEPOSITION**

Pollution from the atmosphere associated with dry deposition in the form of dust, wet deposition in the form of rain and snow, or as a result of vapor exchanges.

### **BENTHIC**

Of or living on or in the bottom of a water body; benthic region, benthos.

### **BENTHOS**

Bottom dwelling organisms, the benthos comprise: 1)stationary animals such as sponges, some worm species and attached algae; 2)creeping forms such as snails and flatworms; and 3)burrowing forms which include most worms, mayflies and midges.

### **BENZO(A)PYRENE**

A PAH which is a suspected carcinogen found in cigarette smoke. It is a byproduct of combustion and is released to the aquatic environment from

industrial processes such as steel and aluminum making.

### **BIOACCUMULATION**

Uptake and retention of environmental substances by an organism from both its environment (i.e. directly from the water) and its food.

### **BIOASSAY**

A biological assessment of water or sediment designed to evaluate toxicity to an organism.

### **BIOAVAILABILITY**

The reactive portion of the total chemical(s) in the surrounding environs, i.e. water, sediment, which is available for uptake by organisms (plant, animal).

### **BIOCHEMICAL OXYGEN DEMAND**

The amount of dissolved oxygen required for the bacterial decomposition of organic waste in water.

### **BIOCONCENTRATION**

The ability of an organism to concentrate substances within its body at concentrations greater than in its surrounding environment or food.

### **BIOCONCENTRATION FACTOR**

The ratio of the measured residue within an organism compared to the residue of the substance in the ambient air, water or soil environment of the organism.

### **BIODEGRADATION**

The chemical breakdown/decomposition of a compound by bacteria/micro-organisms or natural environmental factors (i.e. oxidation).

### **BIOLOGICAL MAGNIFICATION**

The concentrating of a chemical in biota moving up the food chain, so that the top predators have the highest concentration.

### **BIOMASS**

Total weight of all or specific organisms usually expressed for a given area or volume.

# **COLLINGWOOD HARBOUR REMEDIAL ACTION PLAN**



### **BIOMONITORING**

The use of organisms to test the toxic effects of substances in effluent discharges or the surrounding environment as well as the chronic toxicity of low-level pollutants in the aquatic environment.

### **BIOTA**

Plants and animals.

### **BIOTRANSFORMATION**

Enzymatic conversion of a compound to another compound within a living organism.

### **BIOTURBATION**

Biological mixing of sediment by benthic organisms which results in physical, chemical and/or biological changes in sediment to a depth generally not greater than 10 cm. Can result in the transport of contaminants from sediment into the water column.

### **BIS**

In chemical formulas means that a chemical grouping/radical occurs twice in a molecule.

### **CARCINOGEN**

Cancer-causing chemical or substance.

### **CHIRONOMID**

Any of a family of midges that lack piercing mouth parts as adults. Larval forms are sediment dwelling burrowing invertebrates.

### **CHRONIC**

Duration of exposure to substance that is prolonged.

### **CHRONIC TOXICITY**

Toxicity marked by a long duration, that produces an adverse effect on organisms. The end result of chronic toxicity can be death although the usual effects are sublethal; e.g. inhibits reproduction or growth. These effects can be reflected by change in the productivity and structure of the population and community. See also Acute Toxicity.

### **COMMUNITY**

Group of populations of plants and animals in given place; ecological unit used in a broad sense to include groups of various sizes and degrees of integration.

### **CONGENER**

A member of the same taxonomic genus as another plant or animal. Also, a different configuration or mixture of a specific chemical usually having radical groups attached in numerous potential locations.

### **CONSUMPTIVE USE**

Permanent removal of water from a water body. Consumptive use may be due to evaporation or incorporation of water into a manufactured product.

### **CONTACT/NON-CONTACT WATER**

Water which may or may not come in contact with industrial process and thereby pick up contaminants.

### **CONTAMINANT**

A substance foreign to a natural system or present at unnatural concentrations in air, water, soil or food, causing use of those things to be limited. A naturally occurring substance may be found to exceed government guidelines, or objectives and be called a contaminant, e.g. metals.

### **CONTAMINATION**

The introduction of pathogenic or undesirable micro-organisms, toxic and other deleterious substances which can render water, air, soils or biota unfit for use or unhealthy.

### **CONTROL ORDER/REQUIREMENT AND DIRECTION ORDER**

Enforceable orders in Ontario.

### **CONVENTIONAL POLLUTANT**

A term used to describe substances which consume oxygen upon decomposition, materials which produce an oily sludge deposit, and bacteria. Conventional pollutants include phosphorus, nitrogen, chemical oxygen demand, biochemical oxygen demand, oil and grease, volatile solids, and total and fecal coliform, chlorides, etc.





### **CRITERIA**

Numerical limits of pollutants typically established to protect the aquatic ecosystem and human use of the ecosystem.

### **CRITERION, WATER QUALITY**

A designated concentration of a constituent based on scientific evidence and judgement, that, when not exceeded will protect an organism, a community of organisms, or a prescribed water use with an adequate degree of assurance.

### **CRITICAL LEVEL**

See Threshold.

### **CRITICAL RANGE**

In bioassays the range of magnitude of any factor between the maximum level or concentration at which no organisms respond (frequently mortality) to the minimum level or concentration at which all organisms respond under a given set of conditions.

### **CUMULATIVE**

Brought about or increased in strength by successive additions, i.e. effects produced by simultaneous dose of two or more chemicals, or repetitive dose effects of more than one chemical may occur in three ways:

- (1) additive effects - sum of the individual effects;
- (2) antagonistic effects - effect of one chemical is reduced by the presence of another chemical(s);
- (3) synergistic effects - presence of one or more chemicals produces effects greater than the sum of individual effects.

### **CUMULATIVE ACTION**

Increasingly severe effects due to either storage or concentration of a substance within the organism.

### **DENSITY**

Number of individuals in relation to the space.

### **DEPURATION**

Process resulting in the elimination of substance from organisms.

### **DETRITUS**

Organic residue of plant and animal origin that has undergone decomposition.

### **DIATOM**

Any of a class of minute planktonic unicellular or colonial algae with silicified skeletons.

### **DIELDRIN**

A restricted chlorinated pesticide that is persistent and bioaccumulates in all living organisms; causes reproductive disorders in wildlife and is a known carcinogen.

### **DIOXIN**

A group of approximately 75 chemicals of the chlorinated dibenzodioxin family, including 2,3,7,8 - tetrachlorodibenzo-para- dioxin (2,3,7,8 - TCDD) which is generally considered the most toxic form.

### **DIFFUSE SOURCES**

A source of pollution that is not distinct and is widely distributed, such as atmospheric deposition and agricultural runoff.

### **DISSOLVED OXYGEN**

The amount of oxygen dissolved in water.

### **DRAINAGE BASIN**

A body of water and the land area drained by it.

### **DREDGE SPOILS**

The material removed from the river, lake or harbour bottom during dredging operations.

### **DREDGING GUIDELINES**

Numerical guidelines with primary emphasis on the concentrations of toxic materials within the dredge spoils, and directions designed to minimize the adverse effects of shoreline and underwater excavation.

### **DYNAMIC EQUILIBRIUM**

The result of fluctuations of the biological, chemical and physical components of the ecosystem within well defined bounds.

### **ECOSYSTEM**

The interacting complex of living organisms and their non-living environment; the biotic community and its abiotic environment.

### **EFFLUENT**

Waters discharged from facilities to either wastewater sewers or to surface waters.



**Ephemeral**

A plant that grows, flowers, and dies in a few days.  
A short lived organism.

**Ephemeroptera**

Invertebrates (mayflies) that live as adults only a very short time, but can dwell for several years as nymphs in sediment.

**Epilimnion**

The warm, upper layer of water in a lake that occurs during summer stratification.

**Erosion**

The wearing away and transportation of soils, rocks and dissolved minerals from the land surface shorelines or river bottom by rainfall, running water, wave or current action.

**Eutrophication**

The process of nutrient enrichment that causes high productivity and biomass in an aquatic ecosystem. Eutrophication can be a natural process or it can be a cultural process accelerated by an increase of nutrient loading to a waterbody by human activity.

**Exotic Species**

Species that are not native to the Great Lakes and have been intentionally or inadvertently introduced into the system.

**Faculative**

Exhibiting broad life style which allows it to survive under a broad range of environmental conditions.

**Fate**

The result of material deposition via transport, transformation and degradation, i.e. sediment, water column, air or biota.

**Foodchain**

The organization of biota in which organisms in higher trophic levels gain energy by consuming organisms at lower trophic levels; the dependence for food of organisms upon others in a series, beginning with bacteria and plants and ending with carnivores.

**Goal**

An aim or objective towards which to strive; it may represent an ideal condition that is difficult, if not impossible to attain.

**Great Lakes Basin Ecosystem**

The interacting components of air, land, water and living organisms, including humans, within the drainage basin of the St. Lawrence River at or upstream from the point at which this river becomes the international boundary between Canada and the United States (from Article 1 of the 1978 GLWQA).

**Great Lakes Water Quality Agreement (GLWQA)**

A joint agreement between Canada and the United States which commits the two countries to restore and maintain the chemical, physical and biological integrity of the waters of the Great Lakes Basin Ecosystem (from Article 2 of the 1978 GLWQA). Originally signed in 1972 the Agreement was amended in 1978 and 1987.

**Groundwater**

Water entrained and flowing below the surface which may supply water to wells and springs.

**Guidelines**

Any suggestion or rule that guides or directs; i.e. suggested criteria for programs or effluent limitations.

**Half-life**

The period of time in which a substance loses half of its active characteristics (used specifically in radiological work); the amount of time required for the concentration of a pollutant to decrease to half of the original value through natural decay or decomposition.

**Halogenation**

A chemical process by which a halogen, usually chlorine or bromine is introduced into a compound.



### **HAZARDOUS SUBSTANCES**

Chemicals considered to be a threat to humans in the environment, including substances which (individually or in combination with other substances) can cause death, disease (including cancer), behavioural abnormalities, genetic mutations, physiological malfunctions or physical deformities.

### **HEPATIC**

Of the liver.

### **HETEROCYCLIC**

Closed-ring structure, usually of either five or six members, in which one or more of the atoms in the ring is an element other than carbon (c).

### **HEXACHLOROBENZENE**

A by-product of the chemical industry, created during the production of solvents and some pesticides. It is a persistent carcinogen.

### **HYDROLOGIC CYCLE**

The natural cycle of water on earth, including precipitation as rain and snow, runoff from land, storage in groundwaters, lakes, streams, and oceans, and evaporation and transpiration (from plants) into the atmosphere.

### **HYPOLIMNION**

The cold, dense, lower layer of water in a lake that occurs during summer stratification.

### **ICHTHYOLOGY**

A branch of zoology that deals with fishes.

### **INCIPIENT 50**

The level of the toxicant which is lethal for 50% of individuals exposed for periods sufficiently long that acute lethal action has ceased. Synonymous with lethal threshold concentration.

### **INCIPIENT LETHAL LEVEL**

That concentration of a contaminant beyond which an organism could no longer survive for an indefinite period of time.

### **INSECTICIDE**

Substances or a mixture of substances intended to destroy or repel insects.

### **IN SITU**

In place.

### **INTERSTITIAL**

Of, forming, or occurring in interstices of sediment; situated between the cellular components of an organ or structure.

### **LACUSTRINE**

Formed in, or growing in lakes.

### **LEACHATE**

Materials that percolate through solids, soils, solid wastes and rock layers, that can enter the water column.

### **LETHAL**

Causing death.

### **LIPOPHILIC**

Having a chemical affinity for fats, oils or other lipids.

### **LITTORAL ZONE**

Productive shallow-water zone of lakes with light usually penetrating to the bottom; often occupied by rooted aquatic plants.

### **LOADINGS**

Total mass of a substance added to a water body over a specified time; e.g. tonnes per year of phosphorus.

### **MACROPHYTE**

A member of the macroscopic aquatic plant life (i.e. larger than algae).

### **MACROZOOBENTHOS**

Visible bottom dwelling animals, invertebrates. The distribution of macrozoobenthos in an aquatic ecosystem is often used as an index of the impacts of contamination on the system.

### **MALIGNANT**

Resistant to treatment, occurring in severe form and frequently fatal.

### **MASS BALANCE**

An approach to evaluating the sources, transport and fate of contaminants entering a water system, as well as their effects on water quality. In a mass balance budget, the amounts of a substance entering the system less the quantity stored,



transformed or degraded must equal the amount leaving the system. If inputs exceed outputs, substances, often pollutants, are accumulating and contaminant levels can rise. Once a mass balance budget has been established for a pollutant of concern, the long-term effects on water quality can be simulated by mathematical modelling and priorities can be set for research and remedial action.

### **MERCURY**

Recognized as a dangerous substance for many years because it bioaccumulates through the food chain and can affect the central nervous system. It has entered the Great Lakes from a variety of industrial processes and natural sources.

### **METABOLITES**

Biodegraded chemical end products - the product of a bio-transformation process. Substance produced from metabolic activity.

### **METHANOGENESIS**

The process, usually by anaerobic decay of organic matter, which forms or generates methane.

### **MIREX**

A pesticide which has been found in significant quantities in Lake Ontario. It accumulates in the food chain, causes reproductive problems and cancer.

### **MODELLING**

Mathematical simulation of actual conditions often used to predict the fate of nutrients, bacteria, or other chemicals in the ecosystem.

### **MUTAGEN**

Any substance or effect which alters genetic characteristics or produces an inheritable change in the genetic material.

### **MUTAGENICITY**

The ability of a substance to induce a change in genetic material which can be transmitted to progeny, or from one cell generation to another within an individual.

### **NON-POINT SOURCE**

Source of pollution in which pollutants are discharged over a widespread area or from a

number of small inputs rather than from distinct sources.

### **NONPOLAR/HYDROPHOBIC**

Having an affinity for lipids rather than water. Having extremely low solubility in water.

### **NUTRIENT**

A chemical that is essential for the growth and development of organisms.

### **ORGANOCHLORINE**

Chlorinated hydrocarbons.

### **OXIC-ANOXIC**

Oxic - oxygen present

Anoxic - no oxygen present

### **PARTITIONING**

Distribution between different components of sediment, water, and/or biota.

### **PATHOGEN**

A disease - causing agent such as bacteria, viruses, and parasites.

### **PERIPHYTON**

Plants that live attached to underwater surfaces.

### **PERSISTENT TOXIC SUBSTANCE**

Any toxic substance with a long half-life in water or sediment. Can be defined as being greater than eight weeks.

### **PESTICIDE**

Any substance used to kill plants, insects, fungi or other organisms; include herbicides, insecticides, algicides, fungicides.

### **PHENOLICS**

Any of a number of compounds with the basic structure of phenol. Phenolics are produced during the coking of coal, the distillation of wood, the operation of gas works and oil refineries, from human and animal wastes, and the microbiological decomposition of organic matter.

### **PHOTOSYNTHESIS**

A process occurring in the cells of green plants and some micro-organisms in which solar energy is transformed into stored chemical energy.

# **COLLINGWOOD HARBOUR REMEDIAL ACTION PLAN**



**PHYTOPHAGOUS**

Feeding on plants.

**PHYTOPLANKTON**

Minute, microscopic aquatic vegetative life; plant portion of the plankton (free floating aquatic plants); the plant community in marine and freshwater situations which floats free in the water and contains many species of algae and diatoms.

**POINT SOURCE**

A source of pollution that is distinct and identifiable, such as an outfall pipe from an industrial plant.

**POLAR/HYDROPHILIC**

Having an affinity for aqueous environment. Soluble in water.

**POLLUTION (WATER)**

Anything causing or inducing objectionable conditions in any watercourse and affecting adversely the environment and use or uses to which the water thereof may be put.

**POLYCYCLIC**

Organic compound having three (3) or more ring structures that may be the same or different; e.g. anthracene, naphthacene.

**POTABLE WATER**

Water suitable, on the basis of both health and aesthetic considerations, for drinking or cooking purposes.

**PRECAMBRIAN**

The earliest era of geological history.

**PRIMARY TREATMENT**

Mechanical removal of floating or settleable solids from wastewater.

**PUBLIC**

Any person, group, or organization.

**RADIONUCLIDE**

A radioactive substance.

**RAPTORS**

Birds of prey.

**RAW WATER**

Surface or groundwater that is available as a source of drinking water, but has not received any treatment.

**RESUSPENSION(of sediment)**

The remixing of sediment particles and pollutants back into the water by storms, currents, organisms and human activities such as dredging and shipping.

**RIPARIAN**

Living or located on the bank of a natural watercourse.

**RISK ASSESSMENT**

Process for estimating the likelihood that toxic response could take place if people or animals were exposed to certain concentrations of toxic chemical(s) over a given period of time.

**SCAUP**

A diving duck.

**SECONDARY TREATMENT**

Bacterial action on the waste remaining from primary treatment of sewage to decompose organic components of the waste.

**SEDIMENT**

The fines or soils on the bottom of the river or lake.

**SEICHE**

An oscillation in water level from one end of a lake to another due to winds or atmospheric pressure. Most dramatic after an intense but local weather disturbance passes over one end of a large lake.

**SESSILE**

An animal that is attached to an object or is fixed in place (e.g. barnacles).

**SEWER, SANITARY**

A municipal sewer for the collection and transmission of domestic, commercial and industrial wastes to treatment plants; not including land drainage or storm water runoff.

# COLLINGWOOD HARBOUR

## REMEDIAL ACTION PLAN





### **SEWER, STORM**

A municipal sewer for the collection and transmission of storm water runoff, land surface water and water from soil drainage not including any industrial wastes other than unpolluted cooling waters.

### **SLUDGE**

Solids produced by waste treatment facilities and some industrial processes.

### **SOLUBILITY**

Degree to which a substance can be dissolved.

### **STABILITY**

Absence of or predictable fluctuations in populations; ability to withstand perturbations without large changes in community composition or function.

### **STANDARD (Water Quality)**

Regulatory limits concerning the concentration of chemical(s)/substance(s) permitted in effluent discharges and/or waterway(s). Standards are generally dependent on designated use(s).

### **STEADY STATE**

State in which rates of uptake and elimination of chemical/substance are equal - bioconcentration factors can be measured at steady state.

### **STRATIFICATION (or layering)**

The tendency in deep lakes for distinct layers of water to form as a result of vertical change in temperature and therefore, in the density of water.

### **SUBACUTE**

Involving a stimulus whose duration is between acute and chronic.

### **SUB-LETHAL**

Involving a response to a stimulus below the level that causes death.

### **SUSPENDED SEDIMENTS**

Particulate matter suspended in water.

### **SYNERGISM**

The joint action of two or more substances is greater than the sum of the action of each of the individual substances. See also Antagonism.

### **SYNERGISTIC**

Interactions of two or more substances or organisms producing a result such that the total effect is greater than the sum of the individual effects.

### **SYNTHESIS**

The production of a substance by the union of elements or simpler compounds.

### **TAXA**

A group of similar organisms.

### **TAXONOMY**

The process of identifying an organism by its structure.

### **TERATOGEN**

A substance that increases the incidence of birth defects.

### **TERATOGENICITY**

The ability of a substance to produce irreversible birth defects, or anatomical or functional disorders as a result of an effect on the developing embryo.

### **THERMOCLINE**

A layer of water in lakes separating cool hypolimnion (lower layer) from the epilimnion (surface layer).

### **THRESHOLD**

The chemical concentration or dose that must be reached before a given reaction occurs.

TL50 Concentration of chemical/substance in water at which 50% of organisms die after a specified exposure time - generally replaced by LC50 and EC50 values.

### **TOXAPHENE**

An insecticide which was banned in 1983. It has been shown to be a carcinogen.

### **TOXIC SUBSTANCE**

As defined in the Great Lakes Agreement, any substance that can cause death, disease, behavioural abnormalities, cancer, genetic mutations, physiological or reproductive malfunction or physical deformities in any organism or its off-spring, or which can become poisonous after concentration in the foodchain or in combination with other substances.





**TOXICANT**

Substance capable of producing adverse effect(s) in the ecosystem, resulting in injury, dysfunction or even death.

**TOXICITY**

The quality, relative degree or specific degree of being toxic or poisonous.

**TRANSLOCATION**

Movement of chemicals within a plant or animal; can refer to systemic herbicides and insecticides that are moved from the point of contact on the plant to other regions of the plant.

**TROPHIC ACCUMULATION**

Passing of a substance through a foodchain such that each organism retains all or a portion of the amount in its food and eventually acquires a higher concentration in its flesh than in its food. See also Biomagnification.

**TROPHIC LEVEL**

Functional classification of organisms in a community according to feeding relationships; the first trophic level includes green plants, the second level includes herbivores; etc.

**TROPHIC STATUS**

A measure of the biological productivity in a body of water. Aquatic ecosystems are characterized as oligotrophic (low productivity), mesotrophic (medium productivity) or eutrophic (high productivity).

**TUBIFICID**

An aquatic oligochaete or sludge worm which is tolerant to organically enriched sediment and low oxygen concentration.

**TURBIDITY**

A measure of clarity in water.

**UBIQUITOUS**

Present, or seeming to be present, everywhere at the same time.

**UPTAKE**

The transfer of a substance into an organism.

**WATER QUALITY OBJECTIVES**

Under the Great Lakes Water Quality Agreement, goals set by the Governments of Canada and the United States for protection of the uses of the Great Lakes.

**WATER QUALITY STANDARD**

A criterion or objective for a specific water use that is incorporated into enforceable regulations.

**XENOBIOTIC**

Chemical not normally found in nature; i.e. manufactured chemical.



**SUMMARY OF REMEDIAL OPTIONS PROPOSED, ENVIRONMENTAL OBJECTIVES ADDRESSED,  
AND RELATIONSHIP TO PAC USES AND GOALS FOR COLLINGWOOD HARBOUR**

| <b>REMEDIAL OPTION BEING<br/>PROPOSED</b>               | <b>ENVIRONMENTAL<br/>OBJECTIVES ADRESSED<br/>BY IMPLEMENTATION OF<br/>OPTION</b>   | <b>PAC USE GOALS<br/>SUPPORTED IF OPTION<br/>IS IMPLEMENTED</b>   |
|---|--|---|
| <u>Options Involving the sewage<br/>treatment plant</u> |  |   |
| Option 1)<br>Industrial sewage treatment<br>plant       | Reduction in phosphorus (P)<br>sent to STP will result in lower P<br>load to harbour. This will assist<br>in maintaining P in harbour<br>waters at the RAP target of 0.02<br>mg.l <sup>-1</sup> for the control of nuisance<br>algal growth. | Options 1 through 7 will help to<br>control nuisance algal growth.<br>Preventing excessive algal<br>growth improves aesthetics and<br>therefore, passive recreation and<br>sightseeing, and allows for<br>better boating and fishing<br>opportunities, (and therefore<br>recreational, commercial and<br>industrial uses) |
| Option 2)<br>Sewage treatment plant<br>detention pond   | Will permit more efficient P<br>removal during periods of high<br>flow or for rare plant upsets  |   |
| Option 3)<br>Tertiary treatment                         | Greatest potential for removal of<br>P in effluent and reduced P load<br>to harbour  | Land requirements for option 3<br>may conflict with commercial,<br>aesthetic and recreation use<br>goals.   |
| Option 4)<br>Move the sewage treatment<br>plant         | Eliminates over 90% of P and<br>75% of bacteria entering the<br>harbour. Will help maintain fecal<br>coliform counts at or below 100<br>counts.ml <sup>-1</sup> , the provincial<br>bacteriological objective and                            | Moving the plant does not<br>support use of harbour for<br>assimilating STP effluent. Will<br>assist in achieving the PAC goal<br>of water meeting bacteriological<br>objectives for body contact   |

Option 5)  
Computerize operations at the  
existing STP

Option 6)  
Develop new innovative  
technology for the STP

Option 7)  
Extend the Outfall

**Options Involving controls up  
the pipe from the sewage  
treatment plant**

Option 8)  
New technology

Option 9)  
Pre-treatment

**RAP target for body contact  
recreation**

Improve plant efficiency at  
removing nutrients, suspended  
solids and bacteria

Could reduce nutrient and  
bacterial loading to the harbour  
and remove contaminants not  
normally treated by conventional  
STPs

Improved mixing of plant effluent  
with harbour water will reduce  
localized zones of nutrient  
accumulation

Reduction in P or other  
contaminants sent to STP will  
result in lower load to harbour

Reduction in P or other  
contaminants sent to STP will  
result in lower load to harbour

**recreation**

Options 5 and 6 assist in  
meeting bacteriological  
objectives for body contact  
recreation, and reduced turbidity  
results in other recreational  
benefits, primarily aesthetic.  
Removal of contaminants is in  
accordance with the RAP  
philosophy of virtual elimination  
of persistent toxic compounds.

May not meet PAC goal of  
protecting water quality in  
Nottawasaga Bay.  
Will assist in preventing  
nuisance algal growth

Options 8 and 9 address issues  
common to options 1 through 7  
and can also reduce the  
movement of contaminants to  
the STP. This supports the goal  
of healthy aquatic life as well.

**Options involving the harbour itself**

**Option 10)  
Wetlands preservation**

**Will sustain current levels of fish and wildlife**

**Options 10 and 11 maintain or enhance PAC use goals for passive recreation, nature observation, sightseeing, and fishing opportunities.**

**Option 11)  
Habitat rehabilitation**

**Will enhance current levels of fish and wildlife**

**Option 12)  
Black Ash Creek detention pond**

**Will improve habitat and reduce the load of suspended solids to the harbour**

**In addition to providing habitat and fishing opportunities, reduced siltation addressed by options 12 and 13 improves visibility and aesthetic value of harbour waters**

**Option 13)  
Vegetated Buffer Zone along Black Ash Creek and Canals**

**Reduced erosion will enhance habitat and reduce siltation in the harbour**

**Option 14)  
Confined-storage sediment**

**Dredging harbour sediment now could remove future restrictions on dredging and eliminate possibility of future contamination**

**Will cause temporary reduction in bottom dwelling organisms. Will help to sustain healthy aquatic life in the harbour ecosystem. May ensure PAC use goal of marine traffic and business at grain terminal**

**Option 15)  
Increase Exchange**

**P concentrations in the harbour would decrease due to greater mixing with Nottawasaga Bay**

**Reduction in incidents of nuisance algal growth. Could impair water in Nottawasaga Bay**

**Option 16)  
Monitor**

**Assumes that water quality restoration observed in 1989 and 1990 will persist**

**Could identify that restoration of use goals has or will be attained with no further technical options being implemented**

## **Public Awareness Options**

Option 17)  
Environmental playground

Option 18)  
RAP communications plan

Option 19)  
Environmental library

Option 20)  
RAP teaching package

Option 21)  
RAP bulletin board

Option 22)  
Mariner education program

Option 23)  
Information sheets for ice  
fishermen

### **Options encouraging changes in behaviour**

Option 24)  
Control detergents

Options 17 through 21 will increase awareness of water quality issues, sources of contamination and methods for individuals to make choices that enhance water quality. Age groups range from preschool to seniors. Meets GLWQA\* and RAP requirements for public involvement and an ecosystem approach in RAPs

Will reduce or eliminate P and contaminants from bilge products cleaning products from boats

Will reduce or eliminate loss of materials through the ice into the harbour

Elimination of P from household cleaners would reduce P load to the STP

All public awareness options can result in improved water quality in support of use goals. Focusing on human interactions with the environment addresses PAC stipulation that RAP development apply an ecosystem approach

Water quality improvements associated with options 22 and 23 included reduced nutrient load and elimination of a source of potentially toxic substances

Restore use goals impaired by nuisance algal growth

**Option 25)  
Control fertilizers**

**Alternative fertilizers such as compost would reduce a source of P in runoff to storm sewers into the harbour.**

**Restore use goals impaired by nuisance algal growth**

**Option 26)  
Agricultural programs**

**Control of erosion and fertilizer and pesticide application would enhance quality of water entering the harbour**

**Improve aesthetics and associated use goals due to reduction in turbidity in the harbour, eliminate possible source of contamination in support of healthy aquatic life.**

**Option 27)  
Water Conservation**

**STP operation would be more efficient due to decrease in quantity of water requiring treatment**

**Options 27 through 29 have the same benefits as other options that reduce P loading to the harbour, and include raising community involvement in and awareness of water quality issues**

**Option 28)  
Composting and water conserving toilets**

**STP operation would be more efficient due to decrease in quantity of water requiring treatment**

**Option 29)  
Restrict the effects of discharge of grey water from boats**

**Will increase public awareness of individual actions that can affect water quality. Will conform with the March 1991 proposal by MOE to enforce a prohibition on grey water discharge by May 1993.**

**Increased public awareness will help ensure water quality restoration is maintained in support of the RAP.**

**\*Great Lakes Water Quality Agreement**



## APPENDIX IV

### SUMMARY OF REMEDIAL EXPENDITURES/ALLOCATIONS TO DATE

| ACTIVITY  | DATE      | EXPENDITURE              | SECTOR  |
|---|-----------|--------------------------|---|
| STP <sup>1</sup> UPGRADE TO SECONDARY TREATMENT | 1981-1986 | \$8.3 Million            | MUNICIPAL<br>PROVINCIAL                       |
| STP PROCESS AUDIT                               | 1991      | \$100K                   | MUNICIPAL<br>FEDERAL                          |
| STP OPTIMIZATION                                | 1992-1993 | \$600K                   | MUNICIPAL<br>PROVINCIAL<br>FEDERAL            |
| INDUSTRIAL PRETREATMENT                         | 1975-1989 | \$2.5 Million (estimate) | INDUSTRY                                      |
| WATER METER INSTALLATION                        | 1987-1990 | \$800K                   | MUNICIPAL (PUBLIC<br>UTILITIES COMM.)         |
| STORMWATER MANAGEMENT                           | 1992-1993 | \$1.1 Million            | MUNICIPAL<br>PROVINCIAL<br>FEDERAL            |
| ENVIROPARK                                      | 1991-1993 | \$225K                   | MUNICIPAL<br>PROVINCIAL<br>FEDERAL<br>PRIVATE |
| RAP DEVELOPMENT                                 | 1986-1992 | \$800K (estimate)        | PROVINCIAL<br>FEDERAL                         |

**TOTAL SPENT OR ALLOCATED TO DATE (AUGUST 1992): \$14,425,000**

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<sup>1</sup> SEWAGE TREATMENT PLANT

## IMPLEMENTATION STATUS OF RECOMMENDED REMEDIAL ACTIONS

| REMEDIAL ACTION   | STATUS  | PARTICIPANTS  |
|---|---|---|
| OPTION 5:<br>OPTIMIZE OPERATIONS AT STP                         | UNDERWAY: JULY 1992   | TOWN OF COLLINGWOOD<br>MOE; EC: CLEANUP FUND  |
| OPTION 27:<br>WATER CONSERVATION                                | UNDERWAY: BEGAN IN 1987 WITH<br>INSTALLATION OF WATER METERS<br>FOR RESIDENTIAL USERS,<br>CONTINUING EFFORTS OF INDUSTRY                                  | PUBLIC UTILITIES COMMISSION<br>RESIDENTIAL USERS<br>COMMERCIAL USERS<br>INDUSTRIAL USERS                    |
| OPTION 7:<br>RELOCATE STP OUTFALL IN<br>HARBOUR WITH A DIFFUSER | PENDING EFFECTIVENESS OF<br>OPTIONS 5 & 27 IN RESTORING<br>WATER QUALITY  | TOWN OF COLLINGWOOD<br>MOE  |
| OPTION 6:<br>INCORPORATE NEW<br>TECHNOLOGY INTO THE STP         | ONGOING STP UPGRADES; FURTHER<br>UPGRADES DEPENDENT ON WATER<br>QUALITY REQUIREMENTS  | TOWN OF COLLINGWOOD<br>MOE<br>EC: NEW TECHNOLOGY  |
| OPTION 10:<br>WETLAND PRESERVATION                              | UNDERWAY: COLLINGWOOD<br>WETLAND COMPLEX ZONED<br>PROTECTED   | TOWN OF COLLINGWOOD<br>MNR<br>DFO   |
| OPTION 11:<br>HABITAT REHABILITATION                            | UNDERWAY: PURPLE LOOSESTRIFE<br>CONTROL PROGRAM BEGAN JULY<br>1992; FURTHER REHABILITATION IN<br>CONJUNCTION WITH FUTURE<br>DEVELOPMENT AT THE WATERFRONT | TOWN OF COLLINGWOOD<br>PAC/RAP TEAM<br>LOCAL CITIZENS/GROUPS<br>DEVELOPERS<br>MNR; DFO                      |
| OPTION 13:<br>BLACK ASH CREEK<br>REHABILITATION PROJECT         | UNDERWAY: JANUARY 1992  | MOE; EC: CLEANUP FUND<br>NOTTAWASAGA VALLEY<br>CONSERVATION AUTHORITY<br>SERVICE CLUBS; OMAF, MOE           |
| OPTION 26:<br>AGRICULTURAL PROGRAMS                             | UNDERWAY: JULY 1992   | NVCA<br>OMAF  |
| OPTION 17:<br>ENVIROPARK  | UNDERWAY: MAY 1991  | MOE; EC: CLEANUP FUND<br>TOWN OF COLLINGWOOD<br>CORPORATE SPONSORS  |
| OPTION 18:<br>RAP COMMUNICATION PLAN <sup>1</sup>               | ONGOING   | MOE<br>PAC (TO BE INCORPORATED)   |
| OPTION 19:<br>ENVIRONMENTAL LIBRARY                             | ONGOING   | MOE<br>PAC/RAP TEAM   |
| OPTION 20:<br>RAP TEACHING PACKAGE<br>"EXPLORATIONS"            | COMPLETED,<br>PERIODIC REVISIONS  | MOE<br>PAC/RAP TEAM   |
| OPTION 14:<br>SEDIMENT REMOVAL AND<br>CONFINED STORAGE          | IMPLEMENTATION AGREEMENTS<br>BEING NEGOTIATED, JULY 1992  | EC: CLEANUP FUND<br>TRANSPORT CANADA<br>TOWN OF COLLINGWOOD<br>COLLINGWOOD TERMINALS<br>CSL LTD. (PROPOSED) |

<sup>1</sup>OTHER PUBLIC AWARENESS PROGRAMS INCLUDE MARINER EDUCATION PACKAGES INCLUDING INFORMATION ON GREY WATER, INFORMATION ON THE USE OF ENVIRONMENTALLY SENSITIVE CLEANING AND GARDENING PRODUCTS, PROMOTION OF WATER CONSERVATION, DETAILS ON ZEBRA MUSSEL, ETC.

LEGISLATIVE LIBRARY OF ONTARIO



\*9693600020256\*